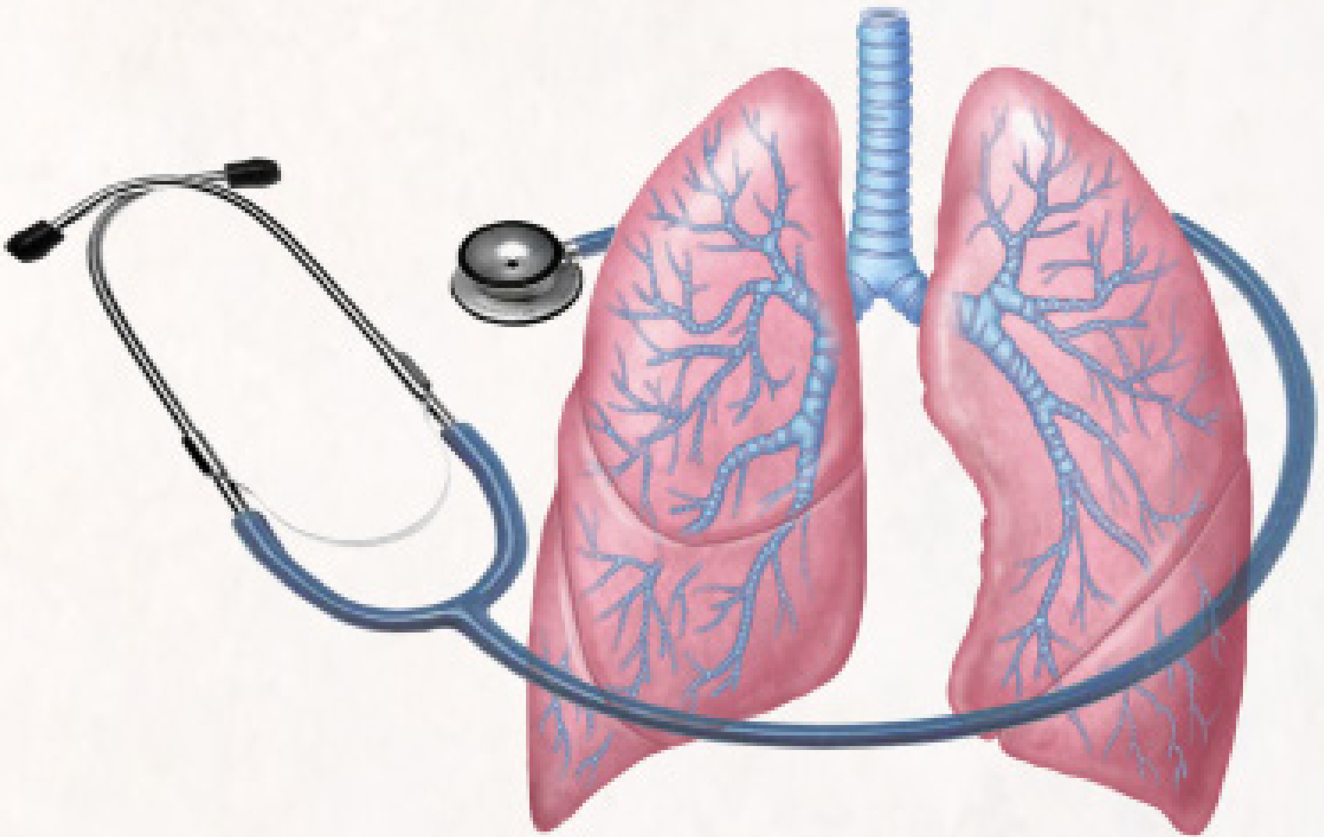
Focus Clinical Notes

Chest Examination



VISIT…

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بسم الله الرحمن الرحيم

يقول الله تعالى فى كتابه الكريم " إنا نحن نحيي ونميت
ونكتب ما قدموا وأثارهم وكل شئ أحصيناه فى إمام مبين"

صدق الله العظيم

ولهذا الأمر حرص فريق العمل على تقديم أقصى درجات الافادة فى عمل هذه المذكرة وتم الاعتماد فى جمع المعلومات من مختلف المصادر:

1- تفريغ محاضرات ال Chest لـ د. أشرف زكى 2016
2- كتاب العملى لـ د . أشرف زكى
3- بعض الصور التوضيحة من الانترنت

فريق العمل

طب الازهر - دفعة 2018

2016

الإصدار الأول

Introduction

Anatomy of The Lung

Surface Anatomy of the Lung

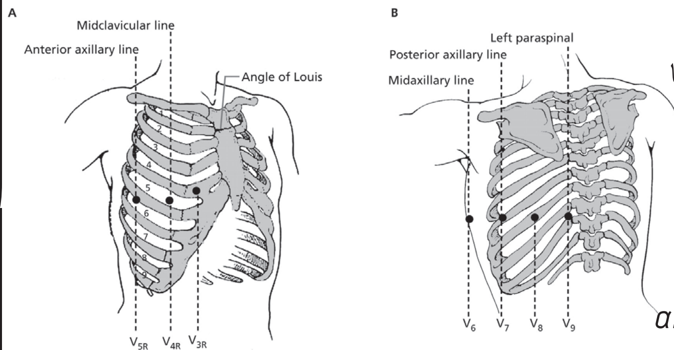
معناه ان انا هاحدد نقط على صدر العيان ووصلهم ببعض
واى نقط فى الدنيا عباره عن التقاء خط طول بخط عرض
خطوط العرض هى ال *ribs and spaces* **ودى بنعدها ب3 طرق**

1. اول واحده خدناها فى الكارديو *(angle of louis)*
2. انك تجيب ال *last rib* ده ال *rib* رقم 12 واعد على فوق وعلى بره بردو
3. *at pex of scapula at 7th*

** لو *female* ترفع ال *breast up and lateral* واجى من تحتها
واعد على بره بردو **

خطوط الطول هى:

1. 3 خطوط أمامية تم شرحهم فى الكارديو
2. 3خطوط جانبيه
   - مع خياطه القميص: *mid axillary line*
   - *ant axillary line along anterior fold of axilla*
   - *post axillary line along post fold of axilla*
3. 3 خطوط خلفيه
   - *vertebral line*



Right Lung

Start at point 2-4cm above inner 1/3 of clavicle > sternoclavicicular junction > angle of louis at midline > downward in midline as far as 6 costal cartilage > out and down along 6 rib in parasternal and midclavicular line > traverse 7, 8 then 9 ribs in ant .mid.then post axillary line respectively then along 10 rib in scapular then paravertebral line > 10 thoracic spine

ونوصلهم مع التحويط على ال *shoulder*

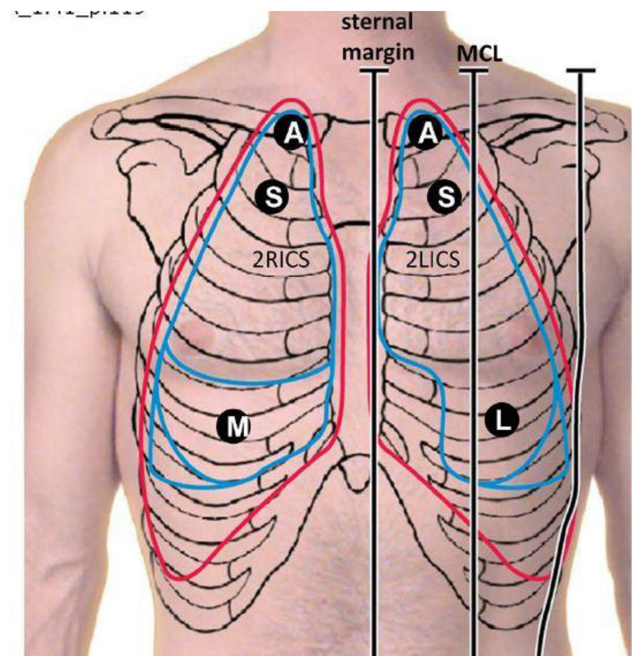
Left Lung

هو هو بس الفرق ان ال *mid line* عند 4 مش 6

Pleura

As lung but lower border is 4-5cm lower ant and post and 9-10cm laterally "Pleural recess "

وفايده ال *pleural recess* عشان لما تاخد نفس تفرد معاك

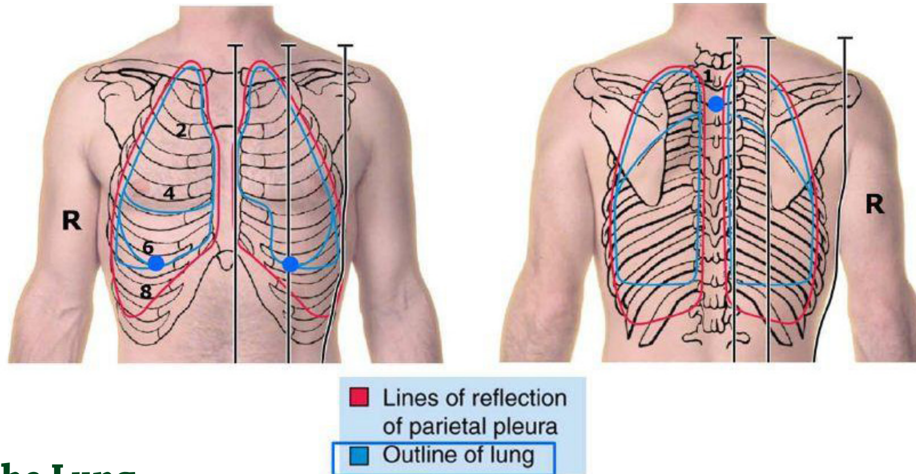


Lung Lobes and Fissures

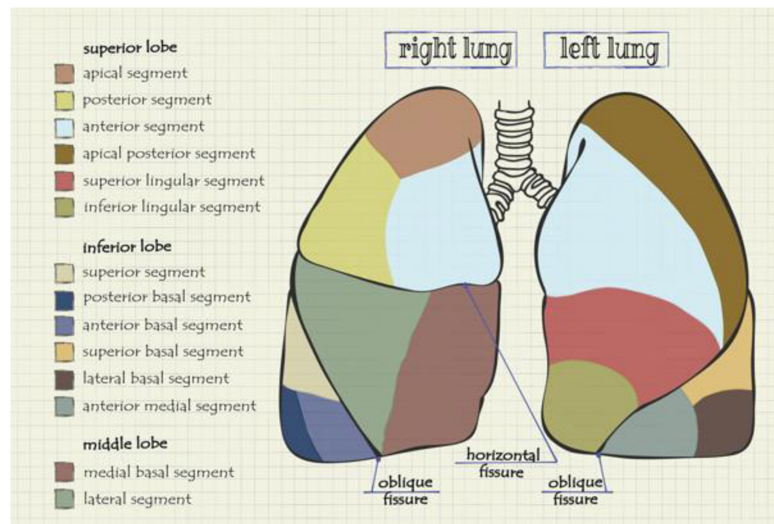
Both lung are divided into two lobes and Rt lung alone is divided again to form middle lobe
1- *oblique* يمين وشمال: هنبتدى من الظهر العيان يتنى رقبته هتلاقى عظمه بارزه عباره عن *c7* وبعدها نعد لحد *t2*. هنبتدى من عند *t2*وبعدين تقول العيان حط ايديك فوق راسك هتلاقى ال *scapula* جات لبره وامشى موازى ل*medial scapular border* لحد ما اقطع ال*mid axillary line* عند *rib 5*. بعد كده ينزل *downward and medially* هيقطع ال *mid clavicular line at 6 rib*

ايهما اكبر حجما ال *upper lobe or lower lobe* ؟ الاتنين قد بعض
بس ك *surface* ال *upper lobe* اكبر من قدام وال *lower lobe* اكبر من ورا وقد بعض *lateral*
عشان كدا لما يسالك افحصلى ال *lower lobe* هتفحص ال *back*
السؤال التانى هيقلك ال *interscapular area* معموله بيمين ؟
معموله بال *apical segment of lower lobe*

2- *transverse fissure* يمين بس
المكان اللى قطع فيه ال *oblique* عند *rib 5* . حط فى النقطه دى سن المطوه واقطع ال*upper lobe* نصين *along rib 5* كده اتقسم ل *upper and middle*. **لما الدكتور يسالك ايه المكان اللى تفحص فيه *lower lobe* كويس** قله ال *back*
طب ال *upper lobe* الشمال قله ال *front*
طب ال *upper lobe* **اليمين** قله ال *front* فوق
طب ال *middle lobe* قله ال*front* تحت
طب لوقلك فين المكان اللى تفحص فيه ال *3lobe* مع بعض قله *lateral*
طب لو قلك ال *middle lobe of Rt lung* يقابله ايه فى الشمال قله ال
Lower half of upper lobe (lingula) which covers the heart



Segments of the Lung



Introduction

Trachea

RT MAIN BRONCHUS IN RT LUNG:-

متقسمه الي

-Upper branching bronchi: apical, ant, post

-Medial branching brochi: medial, lateral

-Lower branching bronchi: apical basal ,ant basal, post basal, medial basal and lateral basal

LEFT MAIN BRONCHUS IN LEFT LUNG:

متقسمه الي ..

Upper ,lower

س/ لو bronchus اتقفلت والهوا انحبس جواها ؟؟

ج/الهوا هيحصله absorbtion in circulation ولا يتجدد وبالتالي هيحصل,,segmental collaps

ال segments ليس لها قيمة اكلينيكية ولكن اهميتها فى الاسئلة الشفوى فقط

Kronig's isthmus

تمثل ال surface anantomy بتاع ال apex of lung بتكون زي المنشور الزجاجي

4 corners:

1-sterno clavicular junction.

2-spine of c7

3-junction of lateral 1/3 of and medial 2/3 of clavile.

4-junction of lat 2/3 and med 1/3 of spine of scapula.

5 borders:

1-border. medial 2/3 of clavicle >> ant.border

2-med 1/3 of spine of scapula >> post .border

3-med.border: a line extending from sterno clavicular junction and spine of c7

4-lateral.border: a line extending from lat. 1/3 and 2/3 of clavicale & junction of lat.2/3, med 1/3 of spine of scapula.

5-upper border of trapezius

سموها isthmus ليه ؟؟ لانها كوبري بين حاجتين

Shoulder percussion >>> dull*

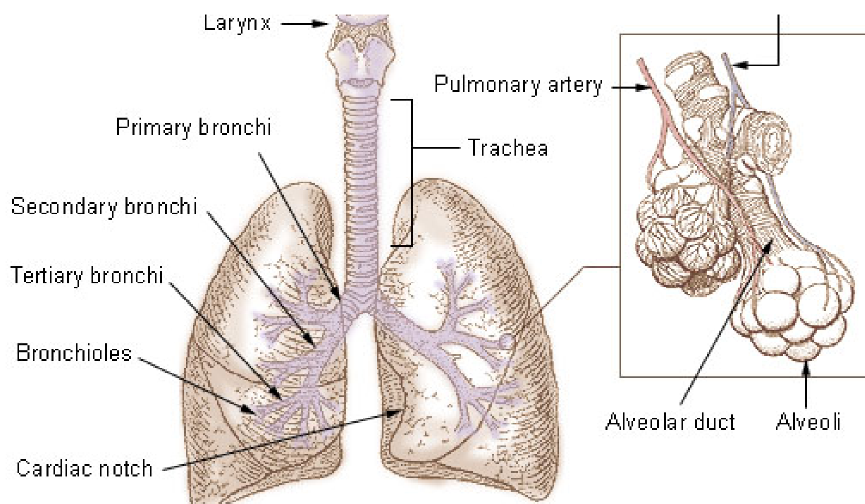
Sterno mastoid >>>dull*

ال بينهم resonance فاعتبروها زي الكوبري بين حاجتين dull

Definition: band of resonance between middle dullness of sterno mastoid &lat dullness of shouder joint

اهميتها ؟؟

زمان كانوا بيفحصوا ال chest من تحت ال clavicle وينسوا ال apex لحد مالوحظ ان في بعض الامراض بتيجي apical فقط من ضمنها



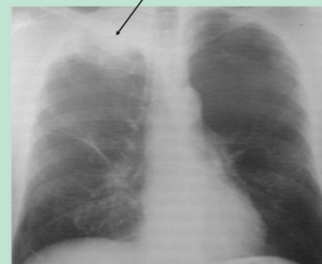
Introduction

Pancoast tumor

it is a bronchogenic carcinoma "malignant tumor"
Superior sulcus syndrom تسمي *apex* لو ضربت ال
؟ *Superior Sulcus* س / ليه سموه
Apex of the Lung ج / لانه مزنوق فى ال
؟ *syndrom* س/ليه سموه
لانه بيعمل اعراض ملهاش علاقة ببعض
بيضغط على كل حاجة حواليه ويؤثر عليها كالاتى :
-Bronchi: dyspnea.
-Esophagus: dysphagia
-Recurrent laryngeal: hoarsness of voice.
-Thorathic duct: lymphdema of upper-
-Sympathatic chain: **horner syndrom**
(ptosis, miosis, anhydrosis & enophthalmos)

Pancoast (Superior Sulcus) Tumor



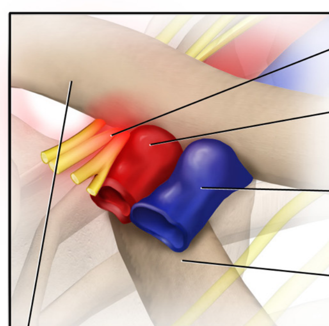


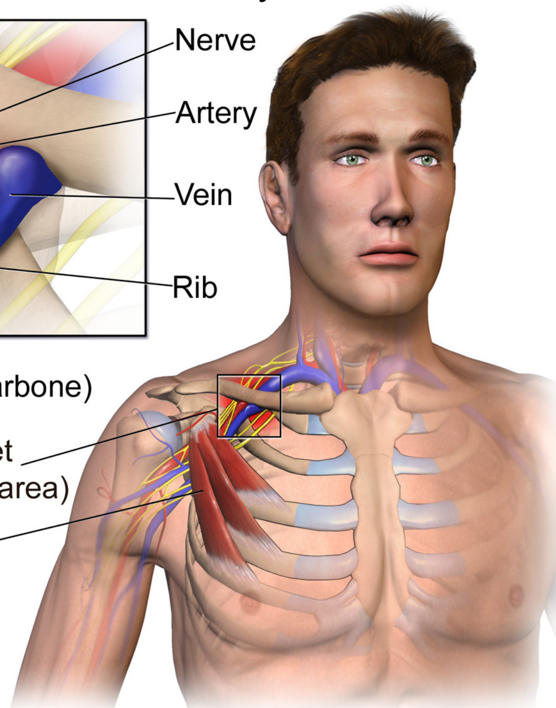
pancosto tumour* اسمه *sympathatic chain* لوضرب اكتر ال*
Its bronchogenic carcinoma affecting apex of lung and invading the sympathatic chain >>>horner syndrome
horner syndrom غير pancosto tumour يعني مفيش
بس هو ال *commonest* علشان كدا هو المشهور

****ايه تاني يعمل *Dullness in apex of lung***
لو فيه ..
2) apical abcess >> T.B
3) apical fibrosis >> T.B
4) apical bronchpnumonia >> T.B
(LUNG >> vessical >> capastant)
مش مليانه دم ع الاخر فالدم بينزل لتحت مع ال *gravity*
**Perfussion more than ventilation* تلاقي ال
**Ventilation more than perfussion* فوق تلاقي
*** AEROBIC >> Apical > T.B, Kelibsilla*
Kelibsella causes > fredlunder pneumonia > to immunocompromized patient
عصايه: *old man*
سرنجه: *diabitic*
ازازه: *alcoholic*

6) MASSIVE plural effusion
7) Incysted plural effusion
8) Fibrothorax >> fibrosis in pleura
9) collapse
10) pleural thickening

Thoracic Outlet Syndrome



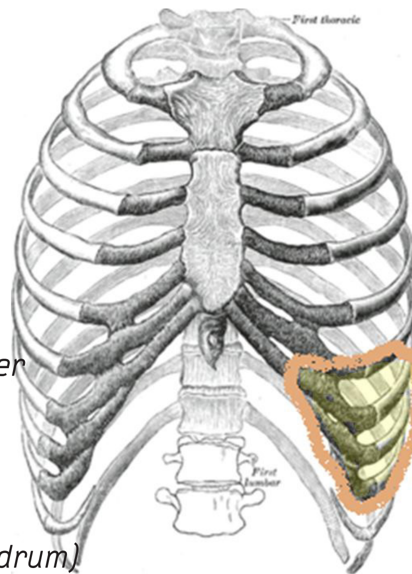


اهميتها :-
– معروف ان ال *percussion* بيمشي من *resonance* الي *dull*
الا في حاله ال *krongs isthmus* من ال *dull* الي ال *resonance* و من جوا لبره

Introduction

Traube's space

-5 (space > mid clavicular line) or 6 rib
and it line inbetween 5 ,6 in the space.
-8 (rib>parasternal)
-9 (rib>mid axellary)
-11 (rib>mid axellary) **ALL ARE LEFT**



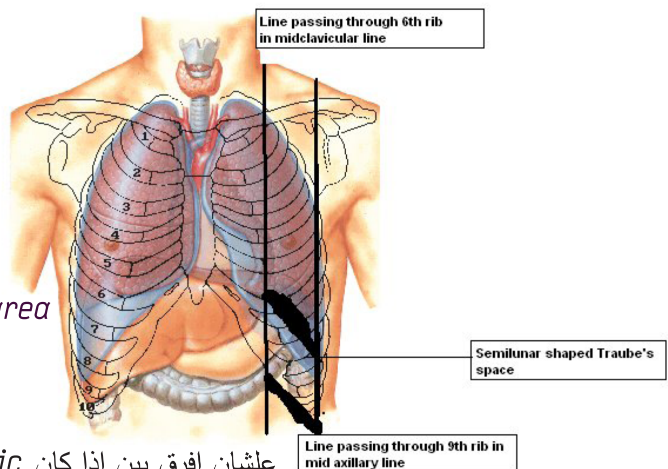
Borders

-Upper>> lower border of the left lung
-Lower>>left costal margen
-Right >>lower border of left lobe of liver
-Left >> ant.border of spleen

Contents:

1)fundes of stomch
2)left plura
Percassion >> tympanitic resonance (as drum)

ممكن تبقي dull عل حسب :-
1) Dullness left >> spleenomegally
2) Rt >> hepatomegally
3) Lower >> ascits or pergnancy
4) Upper >> plural effussion
5) Fundus >> fundus tumour or full stomch
6) Sittus inversus totalis



All dull in:

-stomch ال مكان Liver
segmoidال مكان appendix
-tail ال مكان Head of pancreas
organs مش اماكن محدده لانها مبيتغيرش مكانها trubs area

Physiological Causes of Dullness:

1. full stomch or pregnancy
tidelبال supradiaphragmatic, infardiaphragmatic علشان افرق بين اذا كان percussion
Resonance >> dull خد نفس
Resonance >> abdominal causes
Dull >> supra diaphragmatic .. diaphragmatic paralysis
س/لو لقيت dullnessعلي ال base of lung هعرف منين اذا كان من Lung>>plumonary orgin OR Plura>>plural orgin ??
ج/ من الTraub's area
dull>>plural in orgin
لانها جزء من ال trubs area مش جزء من الlung وبالتالي
1)plural effusion >> dullness on trubs area
2)basal lung consolidation >>
lung border not content معلمش لانه
س/ايه ال يكبر ال trubs area؟؟
الاسباب ال فاتت 5 منهم بينعكسو
1) Splinomegally >> spleenoectomy
2) Hepatomegally >> shrunkin liver
3) Plural effusion >> pnumothorax
4) Ascits >> pnumopretonium
5) Full stomch >> dillated stomch

Despign Sign

1>supra sternal notch
2>angle of lwise>>biforcation of trachia
-spine of t2
body of t4- قصاد
lateral view من ال
bifurcation of trachea قصاد ال
قيمه المعلومة دي ؟؟؟
ان لو وضعت السماعه تحت ال spine of t2
مش هسمع حاجه انما لو في subcranial lymphnode
تنقل الصوت للسماعه فتسمع bronchial breathing

Introduction

Histology of the Trachea

Rt and left بعد مابتنقسم لل
Hylum opining بتدخل ال lung عن طريق فتحه اسمه
MAIN BRONCHUS:- apicail, ant, post
1)segmental bronchi > bronchiols > terminal bronchiouls > Respiratory brochiouls >alveoli
acini بتنتهي ب
panacinar emphysema لما بتتنفخ يحصل
Lung >> bronchial, interstitial
bronchial:- cough receptors > central part > rich in mucus membran, little smooth ms
Prephral part >> rich in smoot ms, little m.m
ليه مش مرسومه مدوره و انما .مرسومه مثلثه interstitial؟
لانها مش مليانه ع اخرها دم. وكمان فيها elastin فيها protein مسؤل .عن elastic recoil of lung
1/vesciral plural متخلق معاها ال lung فهي جزء منها
٢/partial plural متخلق مع ال chest wall مش لازقه فيه انما جزء منه
بينهم monomolecular layer(film) of serous fluid

س/ليه ربنا خلق ال mono مش multi ؟
ج / لان دى الحاجة الوحيدة التى تحقق ال Lubrication & Adhesivness
لو كانت multi هتعمل lubrication بس ... ولو كانت connective tissue هتعمل adhesivness بس
(يرجى سماع شرح الدكتور اشرف فى هذه الجزئية : الدقيقة 41 من Anatomy of the Lung)
التطبيقات العلمية
Dysnea then cough > HF
Cough then dyspnea > chest causes
الامراض الصدرية نوعين :
1)paranchimal > pathogen (viral or bacterial) >> pnumocnosis, lung abcess, TB
2)interstitial > autoimmune disease, HF, plural disease
لازم وانت بتاخد الشيت تسأل عن وقت ظهور كل عرض من الاعراض علشان تقدر تحدد السبب
-chronic bronchitis > mucosal hyptrophy
-acute bronchitis > mucosal odema > generalized narrowing in bronchi > generalized wheezing
-Bronchial asthma> bronchi spasm > generalized narrowing > generalized wheezing
ولكن Mucosa اكتر central & Smooth Ms اكتر prephral
-CH.bronchitis > generalized wheeze .. central more than prephral.
-bronchial asthma> g.w > prephral اكتر من central

Emphysema
Q / Can Emphysema do Barrel Chest ?
A / No الهوا ميقدرش ينفخ العضم ابدا وانما العكس اللى ممكن يحصل
But Barrel chest can cause Emphysema
Q / How Barrel chest Happens ?
A / The true volume of Thoracic Cage is: **5 Liters**
And the true volume of the 2 Lungs together is: 2.5 Liters only .. However the thoracic cage make marks on the Lungs .. that is because: in fetus life, Thoracic Cage and Lungs both of them are 0.5 Liters only with Mono-molecular layer of Serous Fluid inbetween
But the growth rate of thoracic cage is **more rapid** than Lungs ..
So, - the Thoracic Cage stretches the Lung outside and make its volume 2.5 Liters.
And – The Lungs pull the Thoracic cage inside and make its volume also 2.5 Liters.
** Smoking destroys the Elastin and decrease the elastic recoil of the lungs .. they lose their ability to pull the Thoracic Cage inside. So, the Thoracic Cage returne to its normal size (5 liters) which Called Barrel Chest .

Compressive Collapse

بيسمى بهذا الاسم مجازا لكن مبيحصلش اى ضغط ابدا من الماء على الرأتين وانما يقوم الماء بزيادة ال Mono-molecular layer of serus fluids وتحويلها الى Multi

Which Leads to its Adhesivness Function .. Veseral and Parietal Plura will be separated from each others ..

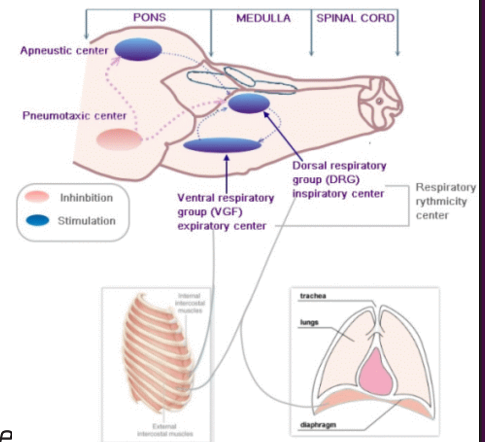
-Lung will return to its resting size (Collapse) ..

-Thoracic Cage will return to its resting size (Unilateral Pulge) .

فالمية معملتش ضغط على حاجة وانما فصلتهم عن بعض فقط .

Physiology of Respiration

Process of respiration is controlled by neural control & chemical control



Neural control

Called Hering Breuer Reflex
Any reflex is composed of SRACEER

Stimulus: *stretch*
Receptor: *J-receptors in the lung*
Afferent: *Vagus*
Center: *Pneumotaxic* — *Apneustic*

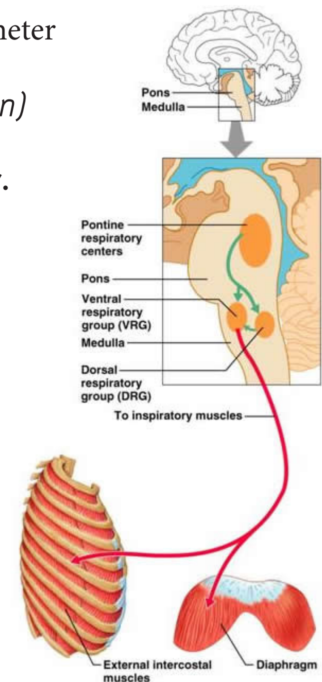
- *Stimulatory* "يشغل النَفَس" — *-Inhibitory* "يوقف النَفَس"
- *Continuous control by:* ↑

J-receptors & Afferent (vagus) → stimulate → Apneustic ce

Efferent: *Vagus* .....
Effector organ: *Respiratory muscles*

**Intercostal M* → Contraction → ↑ antero-posterior & horizontal diameter
* Diaphragm → Contraction →↑ vertical diameter

Response:↑ *Thoracic volume* →↓ *Intera-alveolar pressure (Inspiration)*



N.B$_1$: *Expiration is a passive process depends on Elastic recoil of the lung.*
N.B$_2$: *Inspiration is an Active process depends on Muscular action.*

Clinical Applications on physiology of Respiration

افترض ان *stimulation of alveolar stretch receptors* محتاج : 5 (5 أي حاجة ، 5 وحدات ضغط مثلاً)

طيب لو عندك *transudate or exudates* مالي مثلا 3 ... يبقى فاضل لك فقط 2

تيجي تاخد 1/4 ربع نفس يحصل علطول *expiration*

Due to Stimulation of stretch receptors → Apneustic center

وبالتالي

Tachypnea & dyspnea = Enhancement of Hering Breuer reflex

Inspiration is an active → homogonous process
Expiration is a passive → heterogonous process
-At the beginning of Expiration (maximal stretch of alveolar receptors) → maximal recoil tendency & maximal air exit.
-on progress on expiration →↓ intera-alveolar pressure) →↓ recoil tendency.... So,

- *80% of air exit occur at the 1st 1/3 of expiration*
- *20% of air exit occur at the 2nd 2/3 of expiration*

Inspiratory Sound — *Exp S*

	Sequence of events	Changes in anterior-posterior and superior-inferior dimensions	Changes in lateral dimensions (superior view)
Expiration	① Inspiratory muscles relax (diaphragm rises; rib cage descends due to recoil of costal cartilages). ↓ ② Thoracic cavity volume decreases. ↓ ③ Elastic lungs recoil passively; intrapulmonary volume decreases. ↓ ④ Intrapulmonary pressure rises (to +1 mm Hg). ↓ ⑤ Air (gases) flows out of lungs down its pressure gradient until intrapulmonary pressure is 0.	Ribs and sternum are depressed as external intercostals relax. Diaphragm moves superiorly as it relaxes.	External intercostals relax.

	Sequence of events	Changes in anterior-posterior and superior-inferior dimensions	Changes in lateral dimensions
Inspiration	① Inspiratory muscles contract (diaphragm descends; rib cage rises) ↓ ② Thoracic cavity volume increases ↓ ③ Lungs stretched; intrapulmonary volume increases ↓ ④ Intrapulmonary pressure drops (to –1 mm Hg) ↓ ⑤ Air (gases) flows into lungs down its pressure gradient until intrapulmonary pressure is 0 (equal to atmospheric pressure)	Ribs elevated and sternum flares as external intercostals contract Diaphragm moves inferiorly during contraction	External intercostals contract

Introduction

Emphysema

- *No elastic recoil*
- *over action of acessory muscles of expiration (Abdominal muscles & latismus dorsi)*

Abdominal muscles: تزود ال *Intra-abdominal pressure* فتزق ال *diaphragm* لفوق ، فزيد ال *intera-thoracic pressure*

Latismus dorsi: تثبت ال *shoulder*
فهتلاقي العيان ، ماسك في السرير أو الكرسي جامد عشان يشد ع ال *latismus*

Chronic Bonchitis & Bronchial Asthma

- *elastic recoil is not enough to expull air*
- *expiration become active & homogonus & prolonged than inspiration*

تسمع بالسماعة :
"Vesicular breathing with prolonged expiration ± wheezes "
هتشوف في ال *emphysema & chronic bronchitis (COPD) + bronchial asthma*:
- *Over action of Abdominal muscles & latismus dorsi*
- *Labored breathing (prolonged & difficult)*
- *Piercing of lips (Forced expiration presses on bronchi*
" في حين ان هدفه يدوس ع ال *alveoli* "
so prevents air from getting out .. so piercing of lips occur
"يفرمل خروج الهوا لحد ما ال *alveoli* تفضي "

Restrictive lung diseases (Fibrosis & collapse)

- *defect in proper inspiration*
- *over action of acessory muscles of inspiration " sternomastoid, scalini & trapezii"*

-Contraction of accessory muscles → pull clavicle at 1st & 2nd rib. so the diaphragmatic contraction become more effective. you will see movement of 1st rib, clavicle & the thoracic cage (pump handle movement " thoracic cage moves up & down as one unit ")

-Inspiratory suction (supra-clavicular, supra-sternal & lower intercostal suction) due to deep inspiration & ↑ -ve thoracic pressure

N.B : you may see inspiratory suction in COPD, as there's inspiratory & expiratory problems.

Chemical control

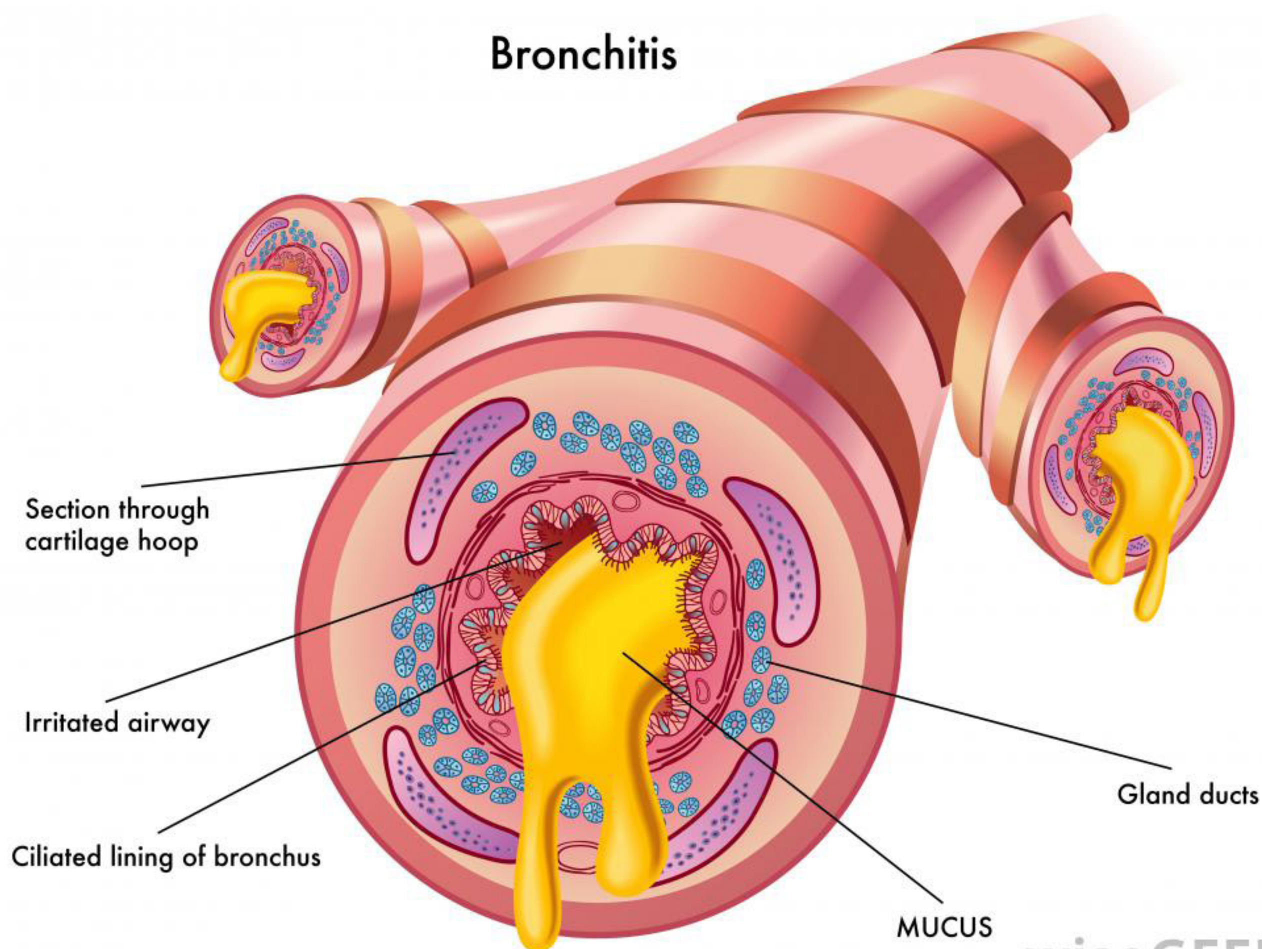
Stimulation	Inhibtion
• ↓ O_2 • ↑ CO_2 • ↑ H^+ (acidotic breathing ↑"rate & depth "	• ↑ O_2 • ↓ CO_2 • severe hypoxia (causes hypoxia of RC) • Drugs : Morphine toxicity & Barbiturate toxicity

Pathology of Chest

Bronchial Diseases:

Bronchitis

Chronic	Acute
Mucosal hypertrophy	*Mucosal Oedema*
Dyspnea , cough & wheezes	
Generalized airway narrowing proximal > distal	
Gradual onset	*Acute onset*
Progressive course	*Regressive course*
Long duration *>3months\ year for 2 successsive years*	*Short duration*
Mucoid sputum "whitish viscid & scanty" بسبب السجاير *Yellow due to infection* *or allergy (esionophiles are yellow)*	*Yellow or green sputum "mucopurulent"*



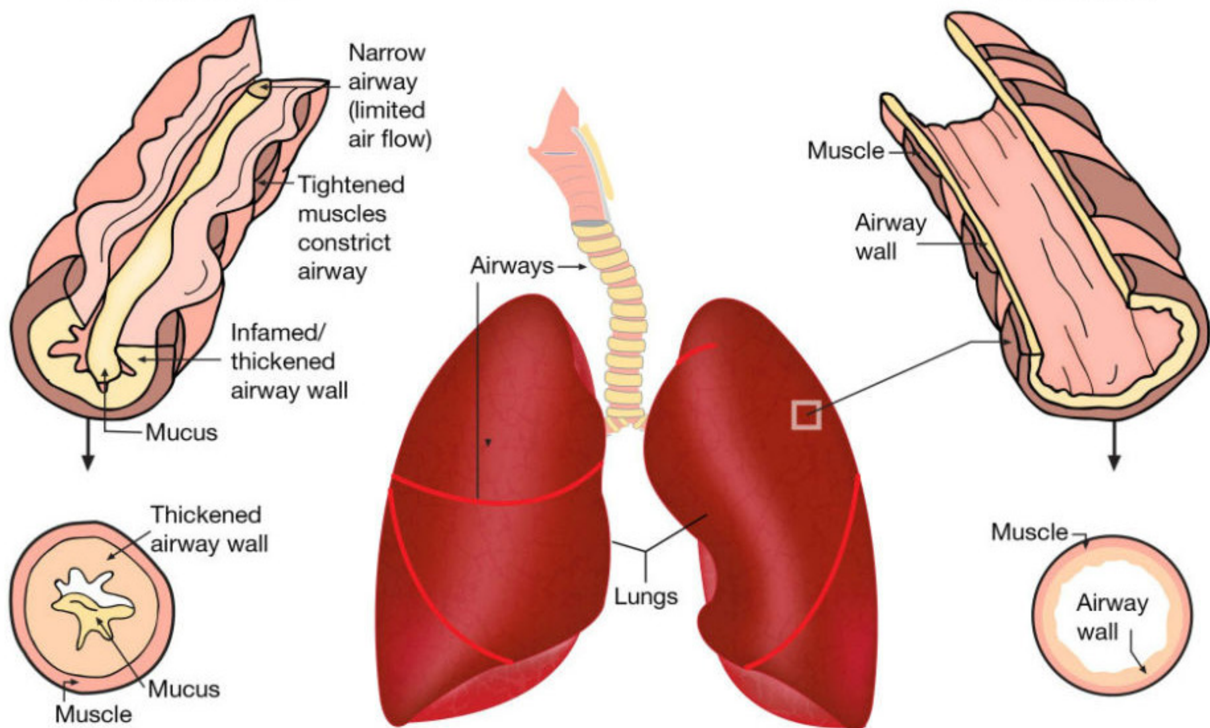
Introduction

Bronchial Asthma

As we know hypersensitivity reaction can be:
Generalized → *anaphylaxis*
Organ affection → *Atopy*
e.g: Atopic rhinitis , atopic bronchitis " bronchial asthma "
Mechanism: *Allergens → stimulate IgE → stimulate immune complex → activate mast cells in BVs around bronchi → rupture of mast cells → chemical mediators (e.g: ILs , LTs , serotonin , Histamine) → bronchospasm, mucosal edema & mucosal hypertrophy → Generalized airway narrowing → Generalized wheezes distal > proximal*

يشتكي العيان من

1 -*Cough (mucus pellets):*
كمية بلغم صغيرة موجودة ف ال *bronchioles* الصغيرة ، ع اما تتجمع وتتشف بتعمل *crusts* زي الرز الأصفر
2 -*Comes in attacks:*
بعد ما يخرج ال *mucus* ،بيقعد فترة
" normal " completely free→ remittent course
NB -If bronchial asthma + معاها *chronic bronchitis*
ميرجعش *"normal"* = ***Asthmatic Bronchitis***



Bronchiectasis

Irreversible dilatation of bronchi, filled with pus and surrounded by areas of collapse & fibrosis

3 Types

1- Infective:

* *Infection → thinning of bronchial wall, fill with pus ± erosion of BVs*
* *Cough of pus ± blood*

N.B: in case of TB > cough of frank blood (bronchiectasis sicca hemorrhagica)

Introduction

* Aerobic infection comes in **Apical** lung zones
* Anaerobic is **Basal** (more common)

* Surrounding alveoli show → pneumonia
1-stage of congestion
2-stage of hepatization (grey & red)
3- stage of resolution:
يحصل فيه
- Tissue destruction & fibrosis
- Collapse: Absorption of exudates > filling with air

Collapse & fibrosis are retractile tissues So, Traction of thinned bronchi → Dilatation

* Destruction of cilia due to (infection or pus) → accumulation of pus
infectionبيئة صالحة لمزيد من ال

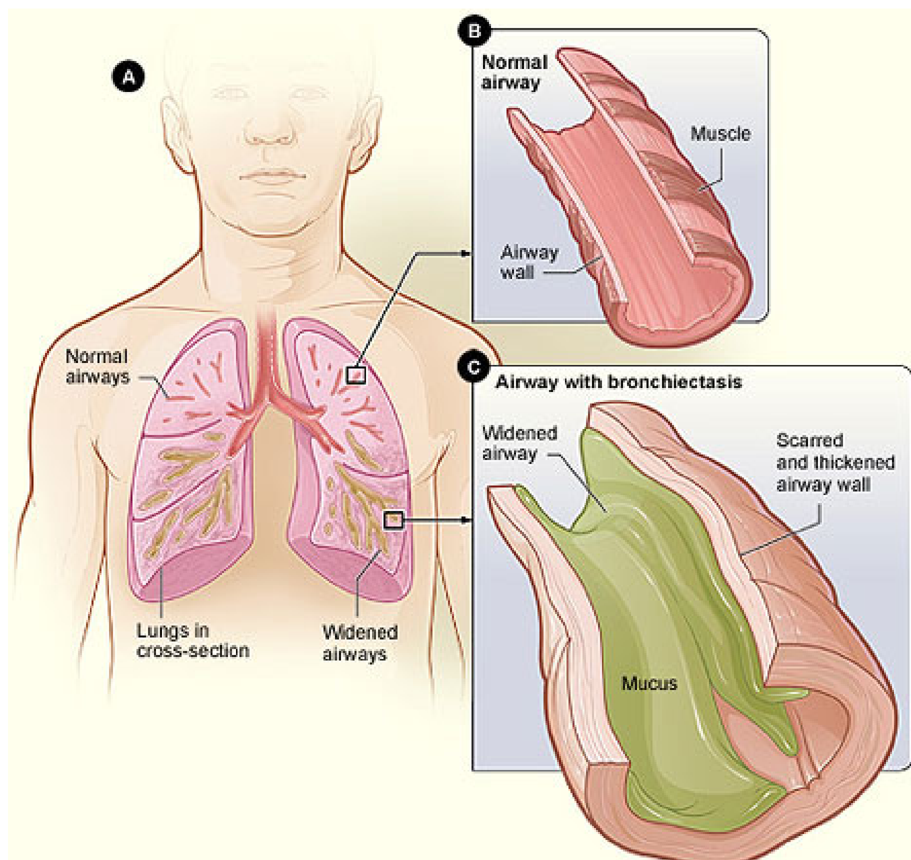
2- Obstructive:

Complete: -obstrucion of proximal main bronchus → irreversible absorbtion of air → (collapse with obstructed main bronchus)
-obstruction of small distal bronchus : collapse with patent main bronchus
So: On -auscultation we will hear " **bronchial breathing** " (collapse is an homogonous media)

Partial:
-valve mechanism
Inspiration → يدخل الهوا
Expiration → يتحبس جوه
- If it is **distal** obstruction → emphysema
لأن بس ال alveoli هي اللي هتوسع
- If its **proximal** → bronchiectasis

3- congenital:

Immotile cilia syndrome :
-sinusitis
-male infertility
-bronchiectasis
± dextrocardia (Kartagner's syndrome)



Introduction

Bronchiolitis

التهاب في ال bronchioles بس عمره ما بيجي لوحده ، لازم بيجي معاه
patchy consolidation = bronchopneumonia

Bronchogenic carcinoma

Localized narrowing → localized wheezing , doesn`t disappear after cough (Fixed monophonic rhonchi) If affects **Apical** lung zones → it is called " **sup.sulcus syndrome** " associated with pressure symptoms
If pressure affects mainly **sympathetic chain** → called " **Pancost tumer** "
Type of patient: male, old, heavy smoker
generalized wheezes ولذلك ال localized wheezes أخطر من ال

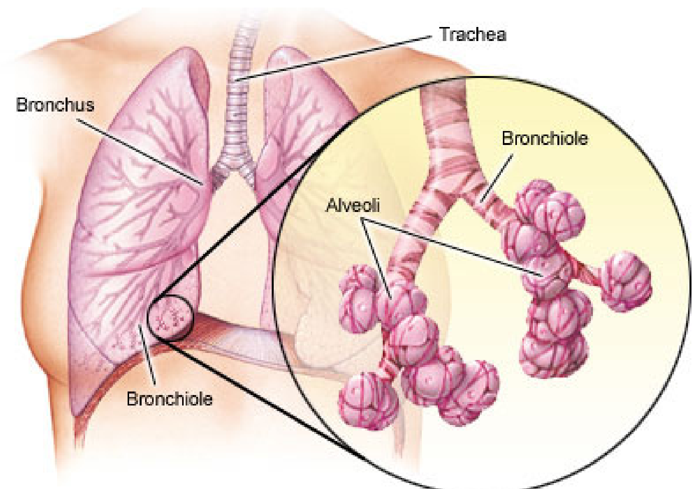
Bronchial adenoma

- Benign , More common in **females**
- **Localized** wheezing
- Bronchial secretions : due to
  LHF → congestion of interstitial BVs → interstitial oedema → then alveolar oedema → bronchial oedema " cough of frothy sputum "

Fibrosis

N.B : Lung is composed of :
Interstitial: interstitial diseases comes from **blood** → **diffuse** + affects **only alveoli** and may small bronchioles

Parenchyma: parenchymal diseases pathogens comes from **air** (e.g : asbestosis , silicosis , infection .. etc) → parenchymal fibrosis affects **bronchi & alveoli** + it is **localized** " on top of localized lesion.



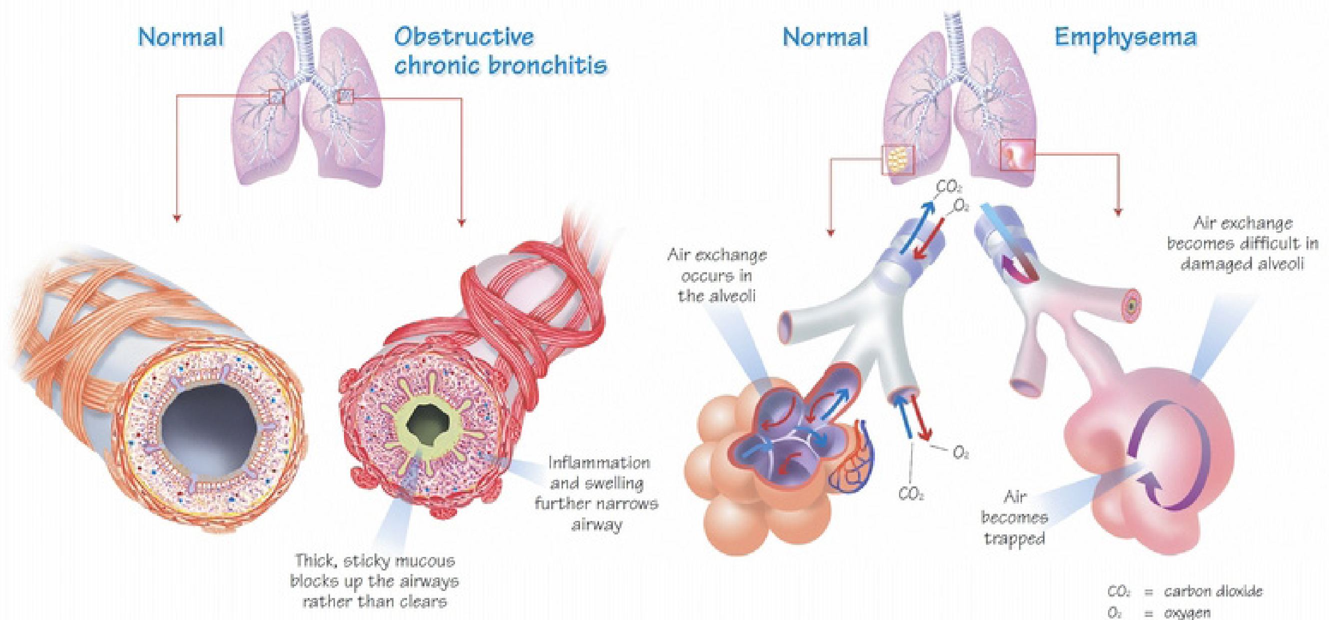
Alveolar Diseases:

Emphysema

Etiology:
1-Inflamatory: see before
If associated with chronic bronchitis = COPD
2- Obstructive: distal partial obstruction (valve mechanism) " see before "
3- compensatory: after segmentectomy or lobectomy

Pathology:
- Heavy smoking leads to :
1. Tar: attracts monocytes to lung → ↑ trypsin
2. Nicotine : ↓ ά1 anti-trypsin
- ↑ trypsin destructs elastin → loss of elastic recoil of the lung → failure of normal expiration → permanent expiratory position
- Heavy smoking leads to: chronic bronchitis → air trap → emphysema

Introduction



Consolidation

stages: see before

occur in:

1- Pneumonia (lobar & broncho)
2- Bronchiectasis
3- Around lung abscess (patch of consolidation with cavity filled with pus)

Clinical applications of consolidation:

1-consolidation is homogenous media → good conductor of bronchial sound → bronchial breathing

N.B : Bronchial breathing : 1- collapse with patent main bronchus
2-consolidation
3- on upper level of pleural effusion (see later)
4-in Tension pneumothorax (see later)

2-in Red hepatization stage → cough of rusty sputum " Golden brown "
Due to oxidation of Fe^{++} of RBCs (صدأ الحديد)

Collapse

- *compressive:* due to Pleural effusion or pneumothorax (see later)
- *obstructive:* - With patent main bronchus

Fibrosis

Interstitial & Parenchymal : See before

Abscess

See before (cavity filled with pus surrounded by consolidation)

Allergic Alveolitis

Attacks (like BA) of dyspnea & cough **" No wheezes "**

Alveolar cell carcinoma

Introduction

Pleural Diseases

Pleurisy

Inflammation of pleural layers → Edema, congestion, roughness & pain (parietal pleura is sensitive to pain)

-Pleuretic pain : stitching more in " lower axillary & beneath breasts "

-pleuretic rub :

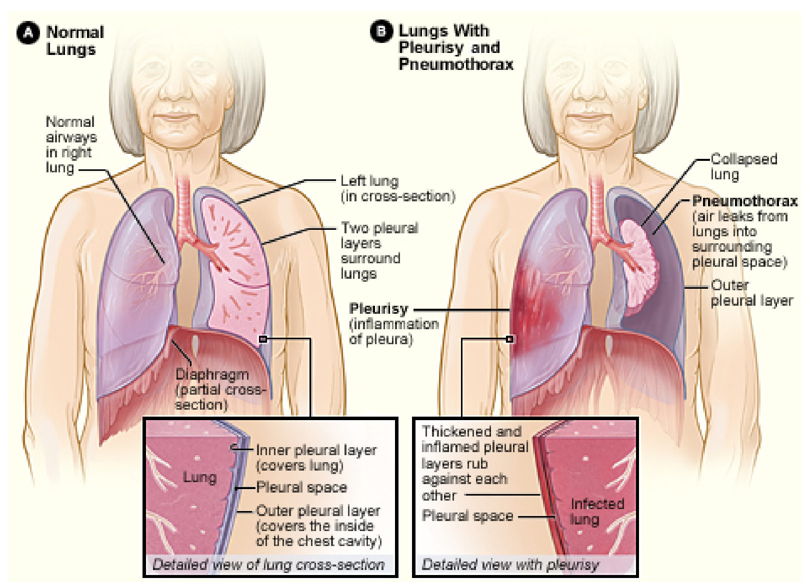
- *Auscultatory sound heard on areas of pain (صوت خشونة نتيجة احتكاك طبقتين الـ pleura)*
- *Heard in chronic patients > acute (less pain & less limitation of respiration)*

Pleural effusion

- *Collection of fluid in pleural sac , it is basal (gravity)*
- *Below fluid level Separation of 2 layers & complete collapse (فصلة الطبقتين عن بعض)*
- *Above fluid level: the 2 layers still normal & complete aeration (normal)*
- *Upper level of effusion: transition zone of partial collapse*
- *Complete collapse = obstruction of alveoli & bronchi*
- *Partial collapse = obstruction of alveoli but bronchi are normal (as if " collapse with patent main bronchus " → bronchial breathing on upper level of pleural effusion)*
- *Complete aeration = bronchi & alveoli are normal*
- *Upper level of pleural effusion is rising laterally (due to capillarity "الخاصية الشعرية " narrow potential space between visceral & parietal layers laterally)*
- ***Types of pleural effusion according to type of fluid:***
  - *-serous: hydrothorax*
  - *-pus: pyothorax = empyema*
  - *-blood: hemothorax*
  - *-lymph: chylothorax*

- *Fibrothorax: pleural thickening and fibrosis (commonly with T.B)*
- *Lung Fibrosis: occur in parenchyma & interstitium*

- *Empyema with broncho-pleural fistula → coughing of pus (suppurative lung syndrome)*
- *suppurative lung syndrome: paroxysmal attacks of coughing pus*
- *causes of suppurative lung syndrome:*
  - *1.bronchiectasis*
  - *2.Lung abscess*
  - *3.empysema with Broncho-pleural fistula*
  - *4.cystic fibrosis (congenital disease)*

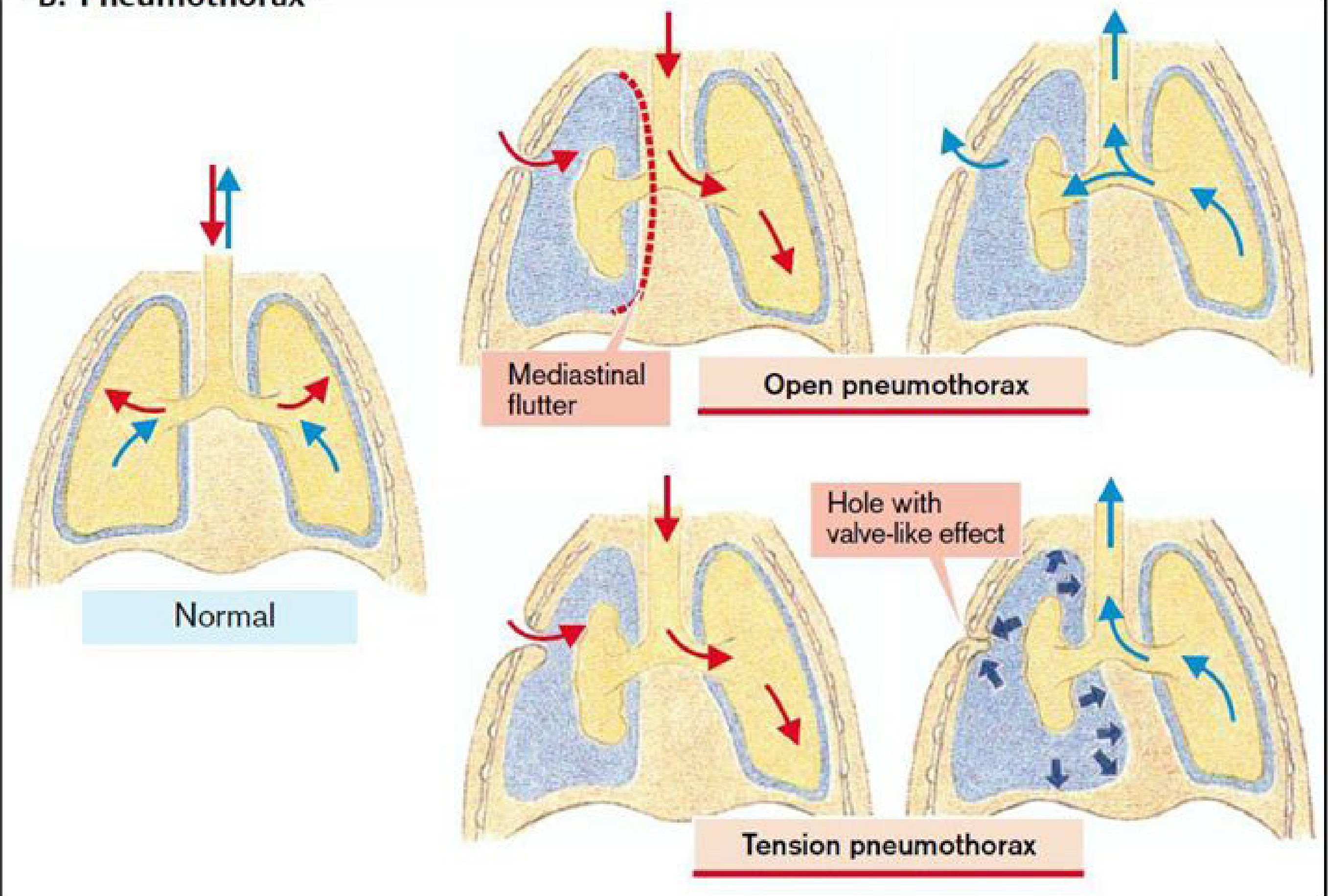


Introduction

Pneumothorax

- Collection of air between 2 layers of pleura
- Acute onset
- 3 types

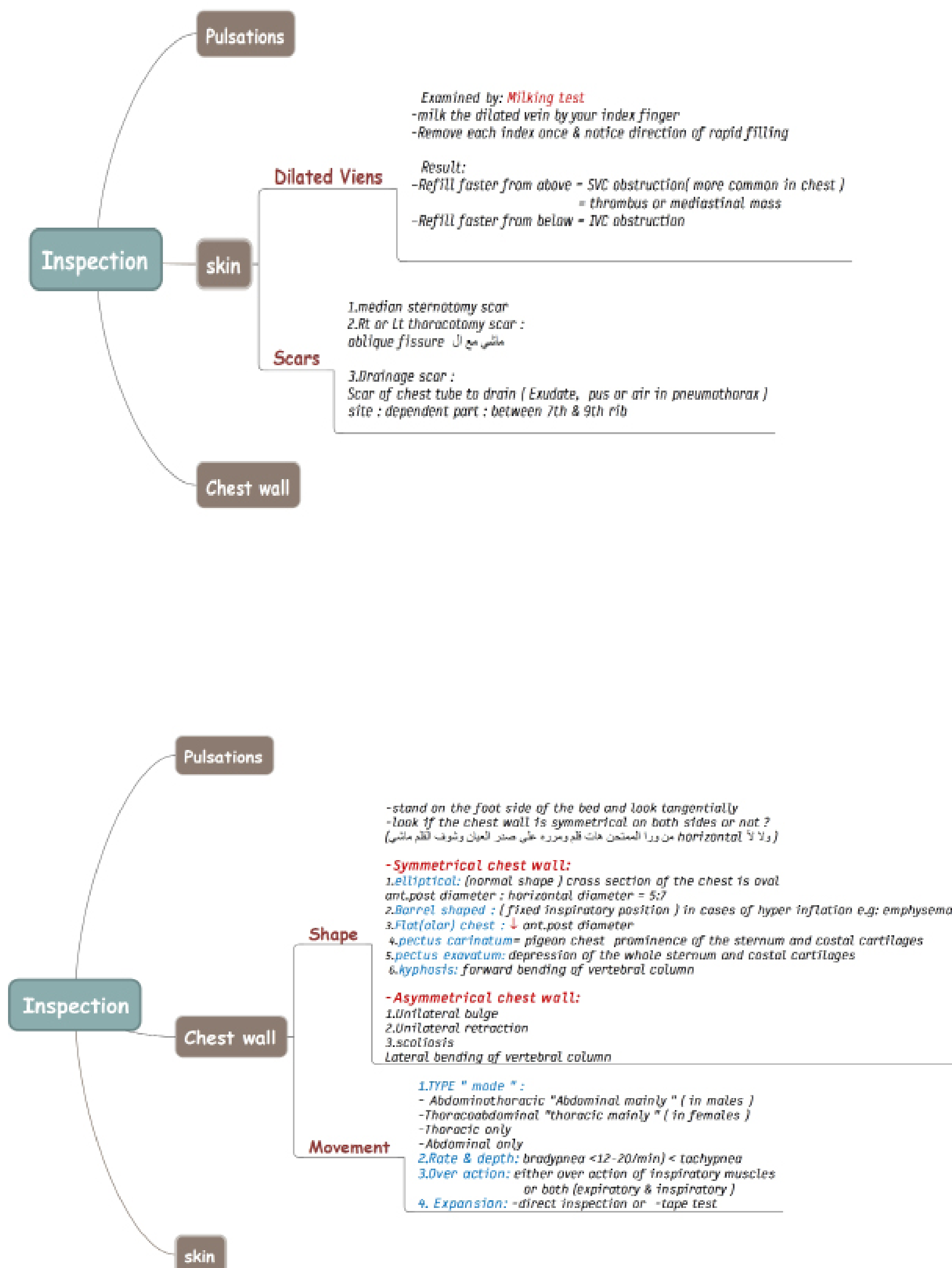
Closed	Open	Tension
-**cause:** Rupture of an emphysematous bullae (due to severe cough) فاتحة على bronchioles صغيرة -small amount of air is trapped between pleural layers -يمتص بمعدل أسرع من معدل تجديده -**course:** regressive	-**cause:** 1.Direct stab wound 2.bronchopleural fistula - inspiration: Air entry between 2 layers - Expiration: Air Exit " وهكذا كل ما يخرج يجي مكانه " -**course:** stationary course -**pleural pressure:** atmospheric	**Cause:** oblique stab wound (واحد أخد مطواة بزاوية) -inspiration: Air entry between 2 layers -Expiration: closure of the wound & trapping of air (valve-like) - ↑ pleural pressure → become +ve > atmospheric pressure -severe lung collapse -Acute dyspnea -Progressive course -**Auscultation:** bronchial breathing مضخم لأن ال air under pressure بيضخم الصوت



Hydro-pneumothorax

- Collection of air and fluid between pleural layers
- X-ray: horizontal fluid level (there's no capillarity, upper pleural layers are separated by air)

Ispection of the Chest


Inspection
Pulsations
skin
Chest wall
Dilated Viens
Examined by: Milking test
-milk the dilated vein by your index finger
-Remove each index once & notice direction of rapid filling
Result:
-Refill faster from above = SVC obstruction(more common in chest)
= thrombus or mediastinal mass
-Refill faster from below = IVC obstruction
Scars
1.median sternotomy scar
2.Rt or Lt thoracotomy scar :
oblique fissure ماشي مع ال
3.Drainage scar :
Scar of chest tube to drain (Exudate, pus or air in pneumothorax)
site : dependent part : between 7th & 9th rib
Inspection
Pulsations
Chest wall
skin
Shape
-stand on the foot side of the bed and look tangentially
-look if the chest wall is symmetrical on both sides or not ?
(ولا لأ horizontal من ورا الممتحن هات قلم ومرره على صدر العيان وشوف القلم ماشي)
-Symmetrical chest wall:
1.elliptical: (normal shape) cross section of the chest is oval
ant.post diameter : horizontal diameter = 5:7
2.Barrel shaped : (fixed inspiratory position) in cases of hyper inflation e.g: emphysema
3.Flat(alar) chest : ↓ ant.post diameter
4.pectus carinatum= pigeon chest prominence of the sternum and costal cartilages
5.pectus exavatum: depression of the whole sternum and costal cartilages
6.kyphosis: forward bending of vertebral column
-Asymmetrical chest wall:
1.Unilateral bulge
2.Unilateral retraction
3.scoliosis
Lateral bending of vertebral column
Movement
1.TYPE " mode " :
- Abdominothoracic "Abdominal mainly " (in males)
-Thoracoabdominal "thoracic mainly " (in females)
-Thoracic only
-Abdominal only
2.Rate & depth: bradypnea <12-20/min) < tachypnea
3.Over action: either over action of inspiratory muscles
or both (expiratory & inspiratory)
4. Expansion: -direct inspection or -tape test

Inspection

Notes

Scars

Causes of Rt or Lt thoracotomy scar:

1. lobectomy (Lung abcess, TB)

antibiotics & Anti TB كانت عمليات مشهور قبل ال

2. pneumonectomy (استئصال رئة)
3. pluroectomy: chronic empyema (pleura تقشير)

في واحد كان عنده effusion امته متلاقيش scar ؟

If it was transudate, aspirated by needle

Chest Wall

-ant.post diameter = from ant to post axillary line

-horizontal diameter = from Lt.ant to Rt.ant axillary lines

Symmetrical Chest Wall

*Barrel shaped chest:

مش معناها برميل ، ولكن معناها 9 حاجات ، كفاية تلاقي منهم اول 3

1. Symmetrical
2. Increased ant.post diameter
3. Horizontal ribs
4. Wide intercostal spaces
5. Wide sub costal angle
6. Reduced the supra-sternal part of the trachea
7. Slight kyphosis (due to loss of elastic recoil of the lung)
8. Working accessory muscles of respiration (pump handle movement)
9. Horizontal shoulders

barrel chest لو لقيت

hyperinflation most probably emphysema تقول

Because: emphysema is a pathological term not clinical term

**Senility* may cause hyper inflation

Air trapping* during attack of **bronchial asthma may cause hyper inflation

ant.post diameter ≠ barrel chest

*Causes of ant.post diameter without barrel chest

1. Precordial bulge
2. Pigeon chest
3. Kyphosis

*Flat (alar) chest

1. Winging of the scapulae
2. Normal in some persons
3. T.B is not a cause of it " ممكن تتسأل فيها ويكون عاوز الإجابة دي ، ولكن ده مش صحيح "

*Causes of Pectus carinatum (pigeon chest):

3 Acquired causes

" حاجة تضغط على الصدر من الجنبين ، فيتطبق لأدام انما ورا لأ لأن العمود الفقري قوي "

1. Rickets
2. Osteomalecia
3. Child with vigorous diaphragmatic contraction (e.g : severe respiratory distress due to Bronchial Asthma since childhood)

Inspection

3 Genetic causes
1. Marphan syndrome (skeletal deformities)
2. Heredofamilial
3. Sporadic (due to mutation gene)

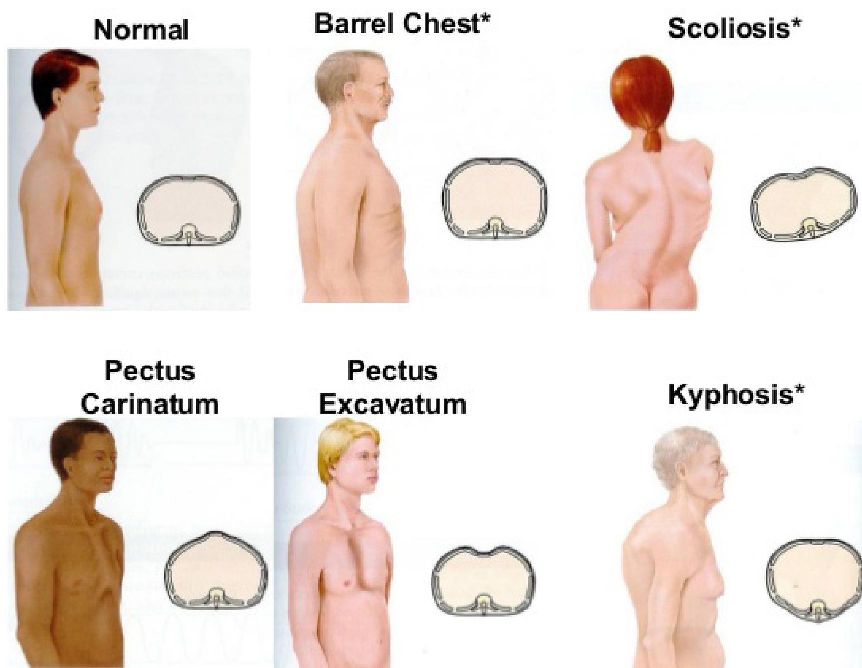
***Rickatic chest = pigeon chest + rickatic roasary**
***Rickatic rosary = recent (active) rickets**

Disappear after ttt of rickets
But, Harrison sulcus remains
Harrison sulcus remains in healed rickets

*Causes of pectus excavatum:
1. Congenital (99%)
2. Acquired (shoe maker "occupational")

*Effects of pectus excavatum:
1. In Mild cases: no effect
2. In marked cases:
- Compress Rt ventricle , c/p simulate "constrictive pericarditis "
- Apical displacement (false impression of cardiomegaly)
- If severe: compress the heart → Heart failure
3. If very severe Disturb anatomy of the thoracic cage → respiratory failure & corpulmonale
4. If associated with marfan syndrome, accompanied by AR or MR

*Effect of kyphosis & scoliosis:
1. Mild: no effect
2. Severe: Disturb anatomy of the thoracic cage → respiratory failure & cor-pulmonale



Physical Examination and Health Assessment, Table 18-3 Jarvis 2008

Inspection

Asymmetrical chest

Limitation of movement in the affected side

؟ أعرف منين ده bulge ولا retraction

There's limitation of movement on the affected side ← أقوله خد نَفَس

(There's another cause for unilateral retraction → (lobectomy or pneumoectomy *
الـ العملية بيخيط بعد chest wallالـ في heart → But no limitation of movement (قوله خد نفس)

Accessory muscles of respiration: Diaphragm & intercostal
Males: depend 70 % on Diaphragm, 30% on inter-costals
Females in Child bearing period: depend 30 % on Diaphragm, 70% on inter-costals
Females before child bearing period: as males

Modes of respiration

Thoracic only

causes:

1. **Pain limitation:** e.g. peritonitis
2. **Mechanical limitation:** e.g. tense ascites , pregnancy , tumor or any cause that↑abdominal pressure "organomegaly "
3. **Diaphragmatic paralysis:** No abdominal movement + inspiratory indrawing of abdomen "تدخل لجوة "= Abdominal paradox

Explanation: Diaphragmatic suction by –ve thoracic pressure → -ve abdominal pressure

Abdominal only

Causes:

1. **Pain limitation:** e.g. pleurisy , fracture rib , trauma
2. **Mechanical limitation:** e.g. ankylosing spondylitis " التهاب الفقرات التيبسي " , emphysema (fixed inspiratory position)
3. **Intercostal paralysis** **"chest paradox"** = inspiratory indrawing of chest

How to count respiratory rate?

-If the patient is aware of counting his breathing m consciousness of act of breathing makes it irregular so … pretend to take the pulse while preserving respiratory movement

Causes of bradypnea:

1. Drug induced: morphine toxicity, barbiturate toxicity
2. ↑ ICT
3. Severe Diabetic ketoacidosis

Causes of tachypnea:

1. **Rapid deep breathing (= tachypnea with hyperpnea = Hyperventilation= air hunger)**
   - Exercise
   - Emotional stress
   - Diabetic ketoacidosis (acidotic breathing=kaussmaul sign)
   - Salicylate poisoning

2. **Rapid shallow breathing**
   - Tense ascites
   - Pleurisy
   - Severe respiratory disease (hypoxia → ↑ rate with restricted mobility)

Inspection

Restrictive hypoventilation patients: Have a problem with **inspiration only**
1-overaction of accessory muscles of inspiration (scalini, trapezii= pump handle movement)
Thoracic cage move up and down as a one unit during respiration
2-suprasternal, supraclavicular & intercostal inspiratory suction "mistaken by litten sign "

Obstructive Hypoventilation patients: Have a problem with **inspiration & expiration**
-overaction of inspiration: see above
-overaction of expiration:
1-overaction of the abdominal and latismus dorsi muscles
2-laboured breathing & pursing of lips
3-patient sits upright & grasps table or back of chair to fix shoulder

How to test chest expansion?

1. Direct inspection:
-Look tangentionally from the foot side of the bed
-lag & diminished expansion of one side or both during deep inspiration (قوله خد نفس) indicates limited expansion

2. Tape test:
-place zero of the tape on: 4th intercostal space at mid line then place the tape around the chest at or just below the nipples
-Ask the patient to make deep expiration > then measure
-Then ask him to make deep inspiration > then remeasure

Inspiratory/expiratory circumference difference is:
-Normally: 3-5 cm
-healthy young persons: 5-8 cm
-limited: ≤ 2 cm (in most chest diseases)
Severe emphysema: < 1 cm

Pulsations

Importance of Pulsations in Local chest examination:

1. Most causes of invisible apex are chest diseases (emphysema , Lt sided pleural effusion , hydropneumothorax , fibrothorax)
2. Most causes of Apical displacement are chest diseases
(out: fibrosis collapse , effusion , pneumothorax or pectus excavatum
Upward: fibrosis or collapse in apex of the left lung)
3. Signs of pulmonary hypertension & Rt ventricular enlargement may be = cor-pulmonale
In Emphysema the most important sign for cor-pulmonale is epigastric pulsations .. **why ?**
All other pulsations are masked by emphysema

Palpation of the Chest

Comment on: 3T & 3P & 1E
1-Trachea
2-Tenderness
3-TVF(Tactile vocal fremitus)
4-Palpaple rhonchi
5-Palpaple rub
6-Pulsations
7-Expansion of chest

1-Trachea (Upper mediastinum)

1. Tracheal position:

يتعمل ازاي؟ تجيب العيان تقعده وتحط ايدك الشمال فوق راسه توسطنهاله وتحط صباعك في الsuprasternal notch
لو لقيتها فاضية يبقي marked shift of the trachea وغالبا بيبقي معاه من البداية Trails sign اللي هي الtrachea
shifted اوي فعامله unilateral pulge of sternomastoid اكيد لو marked shift هيبقي كدا
لو لقيت Resistance يبقي حاجة من 2 (mild shift or central)
اعمل ايه اقوم جايب ايدي يمين مرة (medial to left sternomastoid) واجيب ايدي شمال مرة medial to right)
حط صباعك كدا هتلاقي resistance هنا زي هنا لو كدا تبقي central (sternomastoid
اما لو لقيت الresistance علي ناحية اكتر من التانية تبقي shifted
في دكاترة تقولك خلي ال bulb medial علشان تحس ال trachea ليه هو انت هتحس ال
tip انت هتحس وجودها ووجودها دا بيتحس بال surface or consistency

تنبيهات مهمة في هذا المقام

** اول حاجة ان صباعك يكون تحت medial to insertion of sternomastoid انما فوق كدا انت بتشوف ال
centralization of larynx انا عايز ال trachea وال trachea تحت
** تاني حاجة ان الطالب يحط صباعه برا ال sternomastoid لازم تكون medial to sternomastoid
** تالت حاجة ان صباعك لازم يكون عمودي علي رقبة العيان
**رابع غلطة ان الطالب بعد ما يلاقي ال resistance يقوم مكمل واللي ادامك دا soft tissue يعني لو عملت كدا ال
sternomstoid هتيجي في جنب وال trachea في جنب يبقي انت كدا غيرت الاناتومي يبقي كدا انت بتفحص عيان تاني هتلاقي
ال shifted بقي centralوالعكس كل دي اخطاء مينفعش نعملها
اول ما تلاقي resistance اقف وشوف ال amount of resistance هنا زي هنا ولا لاء وف صباعك مزنوق بمقدار اد ايه
الناحية دي ودي علشان تجيب ال mild shift
ال normal ان ال trachea central
عمر ما في طالب هيعمل ال technique صح ويطلع النتيجة غلط

طرق تانية

1- انك تثبت راسه وتسيبها بقي مش تحط ايدك عليها وبصباعينك بتستخدم ايديك الاتنين
2- انك تقف ورا العيان وتحسها زى ال thyroid تشوف ال resistance هنا زى هنا ولا لاء
3- الناس اللي عندها Goiterبتتزل مع ال larynx وتمشي يمين او شمال
4- طريقة والعيان نايم تحط صباعين على ال clavicle وتستخدم ايدك الاتنين تحط صباع كدا وصباع كدا
اللي هنعملها هي الطريقة الاولي
لو طلعت shifted ايه الاسباب ياحاجة بتشد او حاجة بتزق

Causes of deviated trachea:

1-Thyroid enlargement.
2-Lesion affecting upper half of lung:

a-**Ipsilateral** pulling lesion:
-Lung fibrosis.
-Lung collapse.
b-**Contralateral** pushing lesion:
-Pleural effusion (if very large)
-Pneumothorax

3-A slight deviation of the trachea to the right may be found in healthy individuals.

Palpation

2-Tracheal length:

suprasternal part of the trachea → 4cm.
reduced suprasternal part of the trachea تحط صباعك في ال suprasternal notch لو لقيت larynx علي طول يبقي فيه
emphysema وبالتالي سببها barrel chest ودي من ضمن علامات ال

3-Tracheal tug:

العيان عنده sever emphysema فصباعك مزنوق بين ال suprasternal notch &larynx(cricoid cartilage) مفيش trachea تقريبا ... تكون النتيجة ان صباعك مع كل inspiration يحصله squeezing ودي اسمها
-Inspiratory tracheal tug (**Campbell's** sign) in **COPD**
-Systolic tracheal tug (**Oliver's** sign) in **Aortic arch aneurysm** (aortic aneurysm overrides left main bronchus pulling it down with each systole).
ال aortic arch لافف علي ال left main bronchus فلما بيحصل aortic arch aneurysm مع كل systole ال aneurysm دا بيتنفخ فيقوم يزق ال left main bronchus علي تحت مع كل systole فال trachea تتشد علي تحت مع كل systole فال larynx تتشد علي تحت مع كل systole فتلاقي ال larynx squeeze your finger مع كل systole مش مع كل inspiration

4-Axial fixation:

المفروض لما تمسك ال larynx وتحركها فوق وتحت تتحرك ملليمترات
لو ثابتة خالص ممكن تشك في malignancy مثبتها (دي متعملهاش)
في الامتحان علق علي ال position بس والباقي دا لو اتسالت فيه

2-Tenderness:

اسباب ال tenderness on chest wall انك تلهب جميع ال layers
+ 2T (trauma &tumour)

Causes of chest tenderness:

1.**Pleurisy:** (lower axillary and beneath breasts).
2.**Chest wall:** –Trauma e.g. Recent injury (fracture rib).
-Inflammatory
-Osteomyelitis.
-Costochondritis(Teitz disese):Tender swelling at upper costochondral junctions .
بتخف لواحدها بعد 15 يوم بعلاج وبدون علاج
-Neoplastic: Leukemia.
-2rymalignantdeposit.
3.**Muscle pain:** e.g. Myositis (localized)
4.**Thrombophlebitis:** of breast veins (Tender cord like structure under skin)=Monders disease.
5.**Skin:** -Dermatitis -Herpes Zoster.
6.**Pericrditis:** central or on left sternal border

N.B: Ischemic heart disease as anginal pain does not produce tenderness but pain.

ازاي تعمله ؟

عينك علي وش العيان وايدك علي صدره بخفة ودلع عينك علي وشه علان توف علامات الالم علي وشه لو سالته بقي مش history
examination ايدك علي صدره بخفة ودلع يعنى gently مش تغرز ايدك في لحمه وتقوله في حاجة بتوجعك لان tender يعنى رقيق
ازاي بقي ايدك علي صدره تحط ايدك
Supramammary, Mammary, Inframammary
Upper axillary, Lower axillary
Suprascapular, Infrascapular, Interscapular
وانت بتدوس الله يكرمك تدوس وتزود الضغطة لحد ما احس ان لو ضغط اكتر من كدا اوجع ال normal
كل ما علامات الالم جت علي وشه earlier دا معناه ان ال tenderness اشد

Palpation

3-Tactile Vocal Fremitus(T.V.F.)

لما تحط ايدك علي الحنجرة وتقول 44 بتحس Vibrations يبقي اللي انت حاسسها دي Palpaple Vibrtions ذبذبات محسوسة ذبذبات صوتية .. صوتي يعنى vocalيبقي ذبذبات صوتية يعنى vocal vibrations ... ذبذبات صوتية محسوسة Palpaple Vocal Vibrations

palpaple= tactile, Fremitus= vibrtions كلمة

يبقي اللي محسوس بالايد دا Tactile Vocal Fremitus ذبذبات صوتية محسوسة

لما تحط ايدك علي صدرك الصوت هيضعف ليه؟

لان الصوت لما يعدي علي ال lung بيضعف ليه؟ لكونها heterogenous media زي السفنجة عبارة عن tissue وهوا ودا يشتت الصوت ويضعفه لانها تنفذ ال low frequency sound ... ولا تنفذ ال high frequency sound دي الرئة بتعمل كدا

لو انت استبدلت ال heterogenous media ب homogenous media زي ال Consolidation

ما هو ال consolidation؟

ال hepatization اللي هو ال alveoli بدل ما يكون فيها هوا يكون فيها cells

ويااما الخلايا دي تكون RBCs وتسمي Red hepatization او pus cells &fibrin وتسمي Grey heptization

يبقي اول حاجة تخلي ال lung homogenous هو ال consolidation

Normal	Increased	Diminshed	Abscent
محسوس بوضوح في كل الاماكن وزي بعض تقريبا يمين زى شمال وفوق زى تحت 1- ليه بقول تقريبا لان ال apical اعلي قليلا من ال basal ال basal فيها lung كبيرة عاملة زي الهرم ف ال alveoli تحت كتيرة 2- وال interscapular ورا واعلي من ال peripheral لان ال inter- scapular فيها bronchi وال bronchi بتضخم الصوت 3- ال right اعلي قليلا من ال left بسبب وجود ال heart -T.V.F. is approximately of equal intensity in each two corresponding areas. -T.V.F. is much diminished where the heart encroaches on the left lung. -T.V.F. in interscapular area is more than lung base (nearer to bronchi). -T.V.F. in Rt. lung is more than in Lt. lung	**محسوس بوضوح في كل الاماكن** لكن مكان منهم اعلي من الباقي بفرق واضح ليه مش قولت ان الاقل هو اللي diminished لاني عرفته انه غير واضح -Lung consolidation e.g. Pneumonia (lobar &broncho) Abscess surrounded by consolidation. Bronchiectasis -Large superficial empty cavity connected to a bronchus. -Collapse with patent main bronchus. -Upper level of pleural effusion	**يكاد يكون غيرمحسوس نهائي** في مكان مايعني تشك انت حاسه او لا -Obstructed bronchus -sever bronchospasm -C.O.P.D. -Soft voice (ask patient to repeat saying 44 in a deeper &louder voice). -foreign body -secretions -tumour	**غير محسوس نهائي في مكان ما** Barrier e.g: -Pleural effusion(fluid) -Pneumothorax (air) -Pleural thickening (fibrosis). -Obesity.

السؤال بقي علي اي اساس بقول increased or normal or decreased or absent ؟

ماكلويد كاتب ان ال T.V.F. is a crude test يعنى غير دقيق النتائج يعنى نسبة ال false negative or false positive عالية. في الكلية بيطلبو تقول Symmetrical or Asymmetrical بيعتبروها مرحلة ابتدائية علشان حساسية ايدك تعرف ان فيه فرق في ال emphysema وال normal الاتنين symmetrical

ولكن ال emphysema بيكون diminished

الاول قول انها Symmetrical or Asymmetrical

ثانيا الجدول والتعريفات

ثالثا السياق

Palpation

Palpation

بعمل ال T.V.F. ازاي ؟

بقسم ال anterior chest ل 3 مناطق وفي الجنب لمنطقتين وفي ال back لـ3 مناطق

Supramammary, Mammary, Inframammary

Upper axillary, Lower axillary

Suprascapular, Infrascapular, Interscapular

وبعدين احط ايدي واقول للعيان قول 44 والف ايدي واقوله قول 44

Supramammry فوق خالص لازق في ال clavicle قول 44

Mammary فوق ال nipple قول44

Inframammary تحت ال nipple قول 44

تحت مستوي ال nipple بيكون ال lower axillary قول 44

فوق مستوى ال nipple قول 44

ال Back 1-suprascapular قول 44

2- Infrascapular قول 44

3- Interscapular بالطول قول 44

اخطاء فاضحة في ال technique

1- لما تدخل علي عيان chronic ومش تقول ليه قول 44 وهو يقول من نفسه كدا هو اللي هياخد الدرجة مفيش حاجة اسمها مقولتش ليه يابني ما هو قال انت بتاخد الدرجة علي اللي انت قولته مش اللي هو قاله فلازم تسمع الممتحن انك قولت للعيان قول 44

2- انك ما تمشيش comparative ما انت لازم تقارن ولازم تلف ايدك انت بدل حسيت في ناحية بال tip يبقي لازم تحس التانية بال tip لانك لو حسيت الناحية التانية بال heel هتقول الاولي اعلي لان ال tip more sensitive than heel

3- انك تخلي العيان يقول 44 وانت ايدك في الهوا يبقي النتايج هتطلع غلط ولذلك لازم تخليه يقولها مرتين وانت حاطط ايدك في كل مكان تقوله تانى قول 44

4- في ال axillary انك بتبتدي ال upper axillary من تحت فتيجي على ال lower axillary تلاقي نفسك عند كلاويه ولذلك لازم تبدا بال lower axillary مش بال upper

5- ال Back انك تعمل علي ضهره كله بما فيهم scapular

مفيش scapular بدالهم فيه interscapular وخد بالك ان عندك رئتين يمين وشمال

وال infrascapular بتتعمل بايدك كلها مرة يمين ومرة شمال

4-Palpable Rhonchi:

ما الفرق بين الزمارة والانبوبة؟

الزمارة عبارة عن انبوبة فيها stenosis

من حسن الحظ ان ال bronchi بتاعتنا مجموعة من الانابيب وليست مجموعة من الزمامير فالهوا داخل خارج مش بيزمر فيها انما لو حصل فيها stenosis تبتدي تزمر الزمارة دي اسمها rhonchi or wheezes لو تخان low pitched يعنى او في ال intensity عاليين loud اوي يتسمعوا بالايد

Causes:

Generalized: e.g. Bronchitis or Bronchial asthma.

Localized: e.g. Partial obstruction by tumour, Foreign body or Secretions.

تحس بحشرجة في صدرك هي دي لو حطيت ايدك هتحسها bronchitis كلنا بنيجي في الشتا يجيلنا

اعملها ازاي؟

حط ايدك في نفس اماكن ال T.V.F وبنفس الترتيب بس بدل ما تقوله قول 44 قوله خد نفس وخرجه وتسمع الممتحن هيقولك مش تقوله يابني خد نفس ماهو بياخد ماهو اي انسان في الدنيا بيتنفس هو م جاييلك Cadivar تفحصه طالما مكتوب في الكتاب قوله خد نفس يبقي اكيد مش النفس الطبيعي والا مش كنا قولناله خد نفس وطالما مش مقصود النفس الطبيعي يبقي لازم نفس عميق علان احس يبقي اقوله خد نفس جامد وطلعه لان غالبا ال wheezes بيتحس في الخروج مش في الدخول

5-Palpable Rub:

الناس اللي عندهم pleurisy فيه خشونة في ال pleura

احط ايدي في نفس الاماكن هي مرة واحدة يا تحس rhonchi or rub افرق بينهم ازاي ؟

تسمع الاول لو طلع rub يبقي دا palpable rub

لو طلع rhonchi يبقي دا palpable rhonchi

لحد ما ايدك تعرف تربط بين اللي سمعته واللي حسيته هتحفظهم بعد كدا تعرف بايدك ال *rhonchi* من ال *rub* مالهاش وصف
وبما ان ال rub غالبا مبيجيش فلو حسيت حاجة قول *palpable rhonchi* لو مش حسيت حاجة انفي الاتنين قول
No palpable rhonchi or rub
ازاي افرق بين ال pleural rub &pericardial rub؟
قوله اكتم نفسك لو راح يبقي pleural rub ودا ماشي مع النفس
اما ال pericardial rub مش بيروح لما يكتم نفسه وكمان دا ماشي مع ال pulse

6-Pulsations:

ما اهمية فحص ال *pulsations* في عيان *chest*؟
See inspections &Cardiology

7-Expnsion of chest:

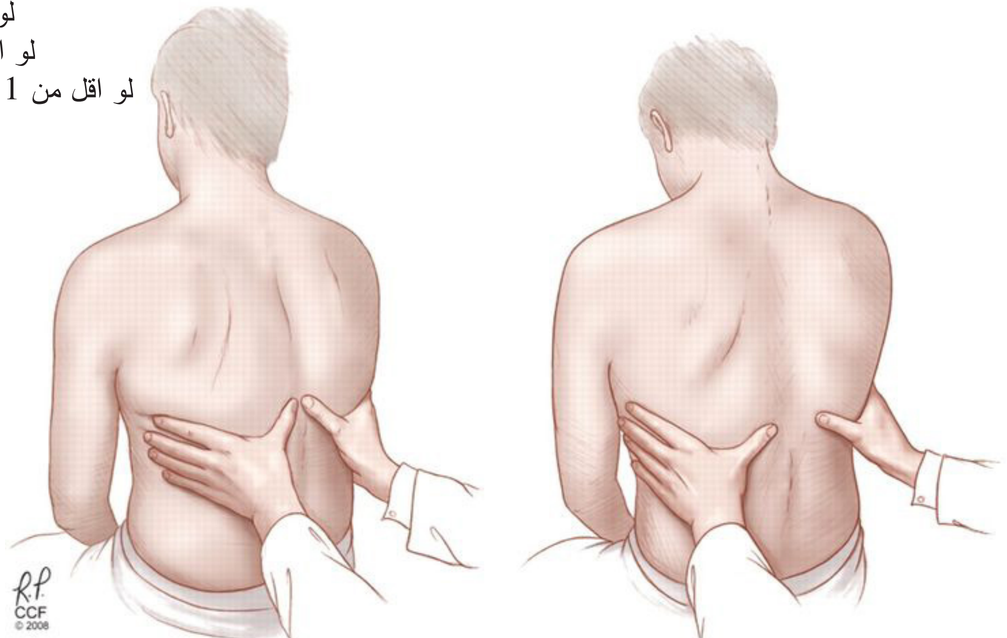
1.Apical (Infraclavicular) expansion:

تحط ايدك وتقوله خد نفس لازم الممتحن يسمعك وانت بتقوله خد نفس

2-Basal expansion:

A-Anterior basal (costal margin) expansion:

اعمل ايدي زى المروحة صوابعي مشاورين علي السرير وال *2 thumbs* مشاورين علي السقف واخد *fold of skin* بايدي كلها م بال *thumb* بحيث ان ال *2thumbs* يكونو قريبين من بعض ويكونو فوق ال *costal margin* مباشرة واقوله خد نفس لازم اخد *fold of skin* واقوله خد نفس علي الاخر لان ادا *expansion* مش *depth*
لو فتح من 5-3 سم يبقي *Normal*
لو اقل من 2 سم يبقي *Diminished*
لو اقل من 1 سم يبقي *sever diminished*



B-Posterior (lower rib) expansion:

بعدين تقعده وتعملها من ورا كمان بحيث ال *2 thumbs* يكونو علي مستوى ال *rib* رقم 10 فوق ال *2 last rib* وتقوله خد نفس هتفتح معاك
الدكاترة في الكلية يقولك شوف *unilateral or bilateral*
Apical or Basal
Anterior or posterior
مفيش *apical* ورا انما فيه *apical* من ورا
فوق مفيش *fold of skin* ليه لان ال *ribs already horizontal* ثابتة مش بتتحرك *from side to side* انما ال *ribs* تحت مايلة فبتتحرك *pucket handle* كدا فبتوسع فلازم *fold*
الدكاترة بيقولو ايه بقي بتتعمل على 3 مستويات غلط جدا لانه كدا حاطط احتمال ان ممكن يبقي فوق وتحت طبيعي وفي النص *diminished* ودا مستحيل يا *apical or basal*
بس فيه مستوى تالت امامي اسمه *subcostal* زي ال *basal* بالظبط بس تحت ال *costal margin* وتقوله خد نفس بتوسع
في حالة ال *emphysema* بتضيق مع النفس ليه ؟
لان عيان ال *emphysema* عنده *flat diaphragm* فبدل ما يتحرك فوق وتحت بيتحرك كدا لجوا
وتسمى *Hoovers sign* من علامات ال *sever emphysema*

Percussion of the Chest

1-Use light percussion except Upper border of the liver &Back (use heavy percussion).
بس الحقيقة لما بقول Light دا لما يجي يسالك لكن فعليا لما تيجي تشتغل اعمل ما بين ال Light &Heavy فيسمي Normal percussion
2- صباعك بالعرض inside the space ما عدا في ال Kronigs isthmus صباعك بالطول فقط
وال Paravertebral region صباعك بالطول ودا يعنى ممكن بالعرض وممكن بالطول
3-Always Comparative to compare identical points
يعنى قصاد بعض بالظبط ما عدا ال unbarred structure زي ال upper border of the liver لان مفيش liver الناحية التانية وال Bare area لان مفيش غير واحدة وال Traubs area لان مفيش الناحية التانية دول بس اللي مفيش comparison فدي قوانين عامة

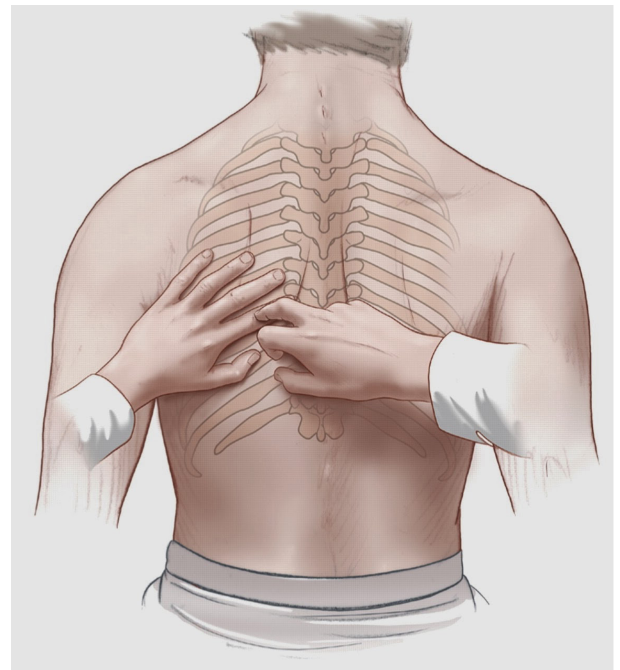
الخطوات :

1- تجيب ال upper border of the liver اول خطوة ولازم تستاذن الدكتور تقوله يا دكتور هبتدي بال upper border of the liver فيه دكتور يقولك اشتغل وانت ساكت مش مهم سمعهاله تجيبه ازاي؟ صباعك بالعرض في ال right second space in midclavicular line وتعمل من فوق لتحت Heavily
الHyper resonance يستنتج يعنى لو لقيت ال liver infra diaphragmatic in 6 or 7 space يبقي دا hyper resonance لانه مغطي علي ال liver
2 ال bare area in chest بالعرض مش بالطول زي ال cardiology
Start from rib n 3 (from resonance to dull)
-if dullness of bare area become resonance
And dullness of upper border of liver in 5^{th} space become resonance
Mean Lung hyperinflation as emphysema and pneumothorax

NB-

1-tympanic resonance occur in tension pneumothorax
2- upper border of liver dullness in space n 6 normally if you do it by light percussion
3- tidal percussion done from back
Normally dullness at rib n 9 do inspiration become resonance
If dullness above space 9 and do inspiration still dullness supradighragmatic dullness/ Infradiaphragmatic /if dullness above space n 9 do inspiration become resonance
لان هنا ال supradiaphragmatic mass زقت ال diaphragm لفوق فلما خد نفس ال diaphragm خدها ونزل
Diaphragmatic paralysis/dull in space n9 still dullness after inspiration
هطلع space فوقه هيبقى resonance لما ياخد نفس يتحول ل dull
لان فى ال paralysis عضله ال diaphragm بقت خرعه فلما ياخد نفس بدل ماتنزل لتحت ال intrathoracic pressure هيشفطها لفوق

باقي الخطوات هنا Comparison امامي جانبي خلفي
1-stretch the clavicle and do direct percussion
2- infraclavicular
in Midclavicular line from 2 to 6 rib
In Midaxillary line from 4 to 8 rib
Suprascapular
Infrascapular from 5 to 10 بشرط تخلى العيان يربع ايديه
Paravertebral بالطول
الKronigs isthmus من جوه لبره بالطول



4- traubs area
احط صباعى فى النص بالطول واكمل لبره واحطه تانى فى النص بالطول واكمل على جوه وبعدين احط صباعى بالعرض فى النص واطلع لفوق وبعدين احطه فى النص وانزل لتحت

NB: Hydropnumothorax diagnosed by shifting dullness as ascites

Percussion

Auscultation of the Chest

Auscultation of Chest

the best is examine by cone but in exam you must use diaphragm, cone is best because of:
a-most chest sounds are low pitched
b-بتقول للعيان خد نفس فلما بياخد نفس النفس بيعمل
stretch of skin under diaphragm cause sound similar to pleural rub
c-diaphragm when move on chest hair may cause artificial crepitation
d- cone more airtight on bony chest in thin person

Location of Auscultation

a-as TVF areas or
b- as percussion areas الاتنين صح بس دى ادق
and you must! - compare each area RT with LT
ask patient to open his mouth widely and respire deeply and rapidly

Comment on:
* Breath Sound * Vocal Resonance * Adventitious Sounds * Special Tests

1 -Breath Sounds

a- TYPES

1- Normal vescular
-description/rustling زى صوت حفيف الشجر - low frequency - expiration is about 1/3 inspiration
-no gap between insp and exp, heard on normal person

2-Vesicular with prolonged expiration
description/the same charcter of normal except expiration≥ inspiration /± wheeze **(No Gap)**
why expiration is about 1/3 inspiration in normal?
because insp is an ***active*** process depend on muscle contraction but expiration is an ***passive*** process depend on recoil tendancy of the lung فبالتالى معظم الهوا يخرج فى التلت الاول بصوت وكميه صغيره تخرج فى التلتين الباقيين زى البلونه لما تنفخها وتسبها تفضى لوحدها)من غير صوت (
-if expiration become active as inspiration (mean use accessory muscle of expiration) in case of
1- loss of elastic recoil > in emphysema-diffuse lung fibrosis (fibrous instead of elastic)
2-obstruction of air way
(elastic recoil متقدرش لوحدها تطرد الهوا لو فى obstruction)
in chronic bronchitis- bronchial asthma- tumour

3-Bronchial breathing
description /hollow زى الانبوبه - expiration ≥ inspiration
-gap between expiration and inspiration
-has 3 types according to degree of hollowness
1- tubular درجه بسيطه كانك بتنفخ فى انبوبه
2-cavernous > درجته اشد شويه كانك بتنفخ فى cavity has lax wall زى ماتعمل ايديك زى ال cup وتنفخ
3-amphoric كانك بتنفخ فى
cavity has rigid wall as bottle (بتفتح ازازه فيها شويه مياه وتنفخ فيها)

Causes of Bronchial Breath Sound

chest طب هيوصل ازاى لازم يبقى فى > good conductive media as
1-consolidation as pneumonia . Around lung abscess. bronchiectasis
2- collapse with patent main bronchus (عشان الصوت يوصل patent)
and upper level of pleural effusion (collapse with patent main bronchus لانه يعتبر)

Auscultation

** collapse with obstructed main bronchus can cause bronchial breathing if apical because the sound transmitted direct from trachea

3-in normal air way (manubrium)
4-displaced trachea
5-dense fibrosis (**not fibrosis only**) because dense fibrosis is homogenous
1.2.3...4..5 is **(tubular sound)**
6-large superficial empty cavity connected to bronchus with laxed wall
(**cavernous sound** because laxed wall)
7-large superficial empty cavity connected to bronchus with rigid wall
8-open pneumothorax (pleura connected to bronchus so it like cavity)
9- tension pneumothorax (air under pressure Magnifies the sound)
7.8.9 is **(amphoric)**

NB الاصوات بتطلع ازاى؟

لما تيجى تتكلم > contraction of larynx muscles cause obstruction of vocal cord with forced expiration
فالهوا اللى خارج يعمل > vibration of vocal cord cause sound
وانت بتتنفس عادى من غير كلام الهوا لما بيجى يعدى على ال glottis cause glottic hiss sound
bronchus media modify quality of hiss sound produce bronchial breath sound
bronchus and trachea is hollow make sound more resonance
expiration =inspiration with gap between
ال gap دى عباره عن الفتره اللى الهوا بيدخل فيها جوه الرئتين ويطلع فمتسمعش صوت وبما ان ال bronchus بتضخم الصوت فلما تقول للعيان يقول ال44 بصوت هامس تسمعه بالسماعه audible whispered sound)
lung media is heterogenous so modify quality of hiss sound produce vesicular breathing, so when lung become homogenus (alveoli مقفوله), lead to no change in sound فنسمع صوت ال زى ماهو bronchus

b-INTENSTY

1-Diminshed in

a-Barrier interfering lung from stethoscope in
1-obesty
2-thick chest wall 3-gross pleural thickening
4-pieural effusion
5- shallow pneumothorax (not open or tension)

b- Diminshed air entry in
1- obstructive air way
-**localized** as tumur or secretion producing collapse with obstructed main bronchus except if occur apical because sound conduct directly from trachea giving sound
-**generalized** as asthma called silent chest
2-decrease respiratory movement in
respiratory muscle weakness-patient doesn`t respire deeply

c-Damage of lung
1-emphysema specially bullae
2-lung fibrosis (not dense)

2- Increased in
a- thin individual b-bronchial breathing c- children

ازاى افرق مابينهم ؟

هفرق مابين ال high وال N هقله قول 44 بصوت هامس لو عالى هسمعها لو طبيعى مش هسمعها وافرق مابين الواطى والطبيعى اقله قول 44 بصوت عادى لو سمعته fuzzy يبقى طبيعى لو مسمعتوش يبقى diminished

Auscultation

2-VOCAL Resonance

1- Normally

-*normal voice is fuzzy* يعنى العيان بيقول 44 بصوت عادى

-*whispering voice not audible* يعنى العيان بيقول 44 بصوت هامس

2- Diminished vocal resonance

normal voice and whispering voice not audible

causes/ same cause of decreased intensity

3-Increased vocal resonance

normal voice loud and clear not fuzzy (bronchophony)

whispering voice is audible clear (whispering pectoriloquy)

cause /same cause of bronchial breathing

4-Aegophony

normal voice nasal tone قله يقول 44 تسمعها صوت معيزى

A الاجانب بيقولوه قول E تسمعها

cause

-*upper level of pleural effusion* فكانك دايس على مناخيره *kinking of bronchi* لان هنا فى المكان ده بيبقى فى بالظبط

-*consolidation*

ملحوظه عشان تفرق مابين انواع ال *vocal resonance*

خلى العيان يقول44 لوحسيت ان الصوت جاى من ال *chest piece* يبقى *normal intensity* يعنى تحس ان الزنه فى ايديك

لوجاى من ال *ear piece* يبقى *high intensity* يعنى تحس ان الزنه فى ودانك

لو حسيته جاى من بره السماعه خالص يبقى *diminished*

NB: **1- sound intermediate between bronchial and vesicular called bronchovescular heard around bronchus normally and in intermediate pathology as resolving pneumonia**

2- cause of prolonged expiration is causes of vesicular with prolonged expiration and bronchial breathing and bronchovescular

لوقلك علق على ال air entry

يبقى قصده ال intensity

3- Adventitious Sounds

1- wheeze

الانبوبه عشان تبقى زماره محتاجه حاجتين تضيق وتبقى مرنه يعنى لو من المطاط تزمر لو من الخشب متزمرش

normal bronchi is flexible so when partially obstructed lead to wheeze

-**Def:** *is continuous (>250m sec)musical sound caused by rush of air through narrow air way*

-**comment**

1- distribution

a-Generalized (more than one area)

1-Bronchitis because of mucosal edema in acute and mucosa hypertrophy in chronic

central > peripheral (mucosa .mucous gland distributed more in central)

2-Bronchial asthma due to bronchospasm

peripheral > central because bronchospasm caused by muscle

(muscle distribution more in peripheral)

3-Emphysema(use of accessory muscle lead to increase intrathoracic pressure during expiration lead to compression of bronchi cause wheeze

4-LF side HF (which cause bronchial edema lead to narrowing and reflex bronchospasm

5-Fibrosis and collapse(صوت متقطع زى صوت الحمام؟؟)

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b- Localized
1-tumour
2-forign body
3-secretion بتروح مع الكحه
اللى يخوفنى اكتر ال localized عشان ال tumor

2-Type
a-Sibilant > high frequency رفيعه
- in sever stenosis
-more in peripheral because bronchus more narrow in peripheral
b-Sonorous زى صوت الشخير low frequency
-in mild stenosis
-more in central as bronchial tumour
NB pitch of wheeze is related to severity not site of narrowing
c-polyphonic is mixed
Cause: 1- emphysema: (increased intrathoracic pressure lead to compressed on all bronchi by same pressure but all bronchi is different in diameter lead to multiple degree of narrowing.
2-athma 3-bronchitis 4- normal

3-Timing
usually expiratory (normally more narrow bronchi in expiration)
if occur **inspiratory and expiratory** indicate **sever** narrowing
if occur **inspiratory only** indicate **very sever** narrowing
(not occur in expiration due to occur of complete obstruction in it)
Causes of inspiratory wheeze
1-secretion
2-squeak
3-sever narrowing
4-stridor لما تسحب الهوا منها تتطبق فتزيق

4- Effect of cough
clears wheezes caused by secretion
-الفرق مابين الstridor وال wheeze انstridor مبيتسمعش بالسماعه لانه مش طالع من الصدر

2- Crepitation
Def: short explosive interrupted sounds
Mechanism:
1-sudden pop reopening of previously premature closed rigid or sticky wall airway with sudden equalization of gas pressure between two airway compartment, When the closed section between them is suddenly opened
مثال للتوضيح نحضر بالونه منفوخه لو خرمتها بدبوس فجاه هتفرقع وتعمل انفجار وصوت ليه؟
لان الضغط جوه البونه اعلى من الضغط برها فلما تيجى تخرمها الخرم بيوسع نتيجه لانها elastic فيحصل
sudden equalization of gas pressure between two airway compartment when the closed section between them is suddenly opened

In crepitation:
لما العيان ياخد نفس ال diaphragm بينزل لتحت. والintercostal بيطلع لقدام فتوسع فال
volume of thoracic cage increases Lead to create -ve pressure >
ال Pr -ve بيشد ال airway على بره فلما يشد لبره
يكبر ويعمل جواه Pr -ve فيقوم ال Pr -ve يسحب الهوا من بره
فيعادل هذه الve -
كمل النفس فال Pr –ve بره ال airway زادت فيتسحب ال airway لبره ويوسع اكتر فبقى جواه Pr -ve اكتر فيسحب الهوا

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معنى كده أن inter airway pressure
مبيلحقش يبقىPr ve – لأن دخول الهوا بيعدله اول بأول
لو انا بقى عندى rigid air way يبقى أثناء
ال inspiratin الairway لما ييجى يفتح يفتح بصعوبة ويفتح متاخر عن معاده
وفى اثناء ال expiration بيقفل بسهوله وقبل معاده
فلما ياخد نفس وال intrathoracic Pr -ve يشد الair way لبره ويعمل جواه Pr -ve فى حين ان الairway لسه مفتحش
فيفضل الp جواه ve– فلما تكمل النفس ال ve – تزيد جواه فلما يفتح فجأه يحصل sudden،
. equalization
فى ال expiration بيقفل premature يعنى قبل مايفضى الهوا ففى شويه هوا جوه
لما تعمل ال expiration intrathoraci Pr is positive
فتضغط على الairway ويفضل الضغط يعلى لحد مايحصل overcome of obstruction
Lead to sudden equalization
في حصل expiratory crepition بس مش موجوده علطول بتيجى على حسب severty !

So crepitation mainly inspiration

The 2nd Mechanism

Cavity contain fluid, Air in fluid cause bubbling (صوت كركره زى الشيشه)
Air way= bronchi or alveoli

1-bronchial crepitation

a- causes
1-bronchitis 2- bronchial asthma (Secretion lead to sticky air way)
3- Bronchiectasis (Dilated bronchi contain pus) (Air in fluid cause bubbling)
4- Alveolar pulmonary edema (bronchial secretion cause bubbling)
5-localized lung fibrosis (rigid air way)
B-time is **early inspiratory**
c- **Scant:** حوالى 3 تكات بس او اقل Because N of bronchi < N of alveoli
D-**coarse:** Because bronchial wall more thick than alveolar wall
E-may clear with cough due to presence of cilia
f- may heard from mouth
G-more in **central**
h- **Not effect** by gravity

2-alveolar crepitation

A-causes
1- Interstitial lung fibrosis
2- Lt side heart failure (rigid air way)

DD of pulmonary congestion interstitial pulmonary edema and acute pulmonary edema?

In lt side HF congestion in vessels occur so congested vessel compress alveoli so open late and difficulty and close premature, This compression Considered rigid air way, Then transudate become in interstitial (rigid air way). When transudate enter alveoli it's called alveolar pulmonary edema (secretion in alveoli and bronchi)

3- Pneumonic consolidation (sticky air way)
4- Abscess (bubbling)
5- Reinflation of previously collapsed lung
A-Tapping of ascites (ascites compress diaphragm and base of lung cause basal lung collapse, when rapid tapping lung expanded suddenly (collapsed lung consider rigid airway)
B-Resolving pnumonia (exudate absorped lead to lung collapse when patient do inspiration lead to Reinflation of previously collapsed lung)
C-Prolonged bed rest (part of lung not act so air in it is absorbed lead to collapse .when

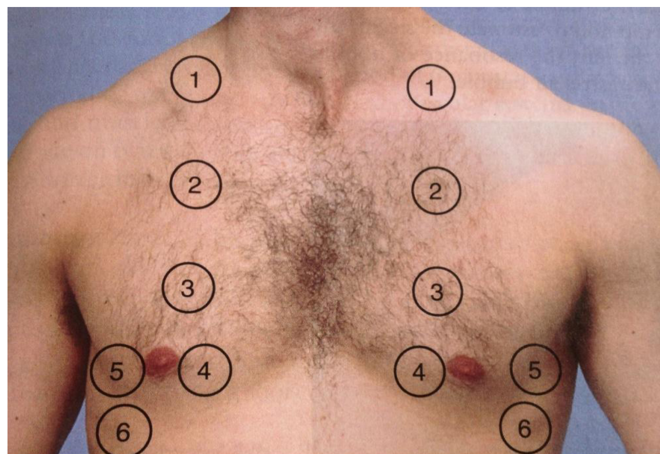
patient change his position and do inspiration lead to Reinflation of previously collapsed lung)
B-Time **late inspiratory**
C-Profuse اكتر من 10 تكات
D-**Fine**
e-f (no)
G-more in **peripheral**
H-**effect** by gravity
In diffuse crepitation it more basal (on sitting) and back (on sleeping)
Because lung consist of layers as pyramid so Basel layer is more compressed by above layers
كل طبقه بتضغط على اللى تحتيها
So Basel layer close premature and open difficulty and late more than other layers

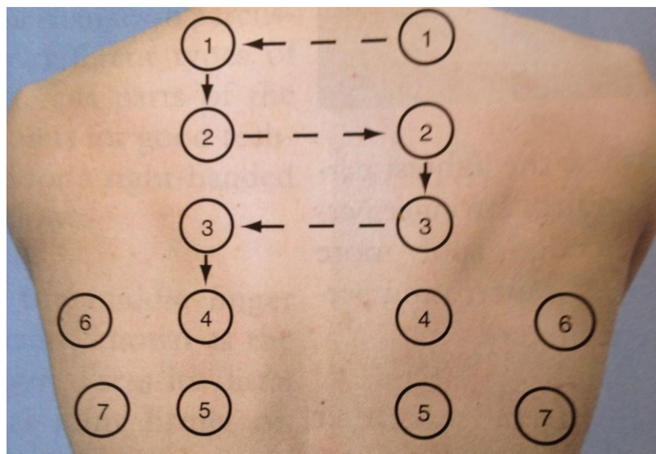
mild عشان كده لو مظهرتش الا لو رفع رجله تبقى
moderate لومظهرتش الا لو نام تبقى
sever لو ظهرت وهو قاعد تبقى

NB: **1-Bronchiectasis occur mainly in medium sized bronchi(bubbling during expiration**
Cause crepitation early inspiratory. Mid inspiratory and expiratory
2-Interstitial fibrosis later become pan inspiratory with late inspiratory accentuation
Because it occur around alveoli. late occur around near bronchi also .so become pan inspiratory
Late inspiratory accentuation occur because alveoli more than bronchi
3- **In lung abscess (coarse) because bubbling mainly is coarse**
4- **Pneumonic consolidation medium between fine and coarse has metallic quality**
5- زى شريط الحبوب لما تتكى عليه من ظهره

3- RUB

1- Pleurisy in lower axillary and beneath breast
صوته عامل زى الجزمه الجديده لما تزيق وتحس انه قريب من السماعه
Late inspiratory and early expiratory
DD between it and wheeze. Crepitation
Not effect by cough
لوضغط على السماعه تعلى
DD between it and pericardial rub?
لو قلتله اكتم نفسك تروح





تم بحمد الله وفضله

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